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An Analysis from 1997 to 2021

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Changes in Peru's Gender Earnings Gap: An Analysis from 1997 to 2021*

Manuel Urquidi, Miguel Chalup, and Liliana Serrate**

Abstract

The gender earnings gap in labor earnings between men and women in Latin America is an obstacle to achieving gender equality and sustainable development. In Peru, the earnings gap persists despite showing a decreasing trend over time. Most of this gap is not explained by observable variables from household surveys, suggesting the presence of gender biases. Additionally, the gap is more significant among informal sector workers. There is also a heterogeneous earnings difference favoring men in most occupations.

To analyze the gender earnings gap in labor earnings in Peru between 1997 and 2021, this study uses data from the National Household Survey (ENAHO), harmonized by the Inter-American Development Bank (IDB). Two methodologies are presented to estimate the gap: the Blinder-Oaxaca decomposition and the Ñopo decomposition.

The analysis shows that while the total gap has reduced, as has happened in many other countries in the region, this reduction is generally associated with the explained gap rather than a reduction in the unexplained gap, which persists over time. This indicates that additional efforts are needed to understand the observed disparity.

JEL Classification: J16, J31, J71.

Keywords: gender economics, earnings gap, discrimination.

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** Inter-American Development Bank

Introduction

In recent years, Latin America and the Caribbean (LAC) have experienced significant changes in the traditionally assigned roles of men and women: there has been an increase in women's political representation, as well as in their levels of education and participation in the labor market. However, challenges still persist regarding women's labor inclusion and opportunities for professional development (Frisancho and Queijo, 2022).¹

Previous studies have documented the presence of a labor earnings gap affecting women in the region (Ñopo, 2012). These studies have shown that women, even when working in similar positions and having comparable educational levels to their male counterparts, earn lower incomes. Therefore, it is necessary to analyze the underlying factors contributing to this situation.

When examining the challenges related to women's labor inclusion and opportunities for professional development, (Ñopo 2012) points out that in Latin America and the Caribbean (LAC), there is a persistent problem of occupational and hierarchical segregation. Women tend to work in the informal sector in a higher proportion, are less represented in executive positions and perceive significant differences in their labor incomes compared to men. Although LAC has experienced improvements in gender equality indicators since the late 20th century (Chioda, 2011), as well as an increase in women's political and labor participation (Ñopo, 2012), income differences for similar jobs still persist in most countries, constituting an unjustifiable form of inequality (ILO, 2019c).

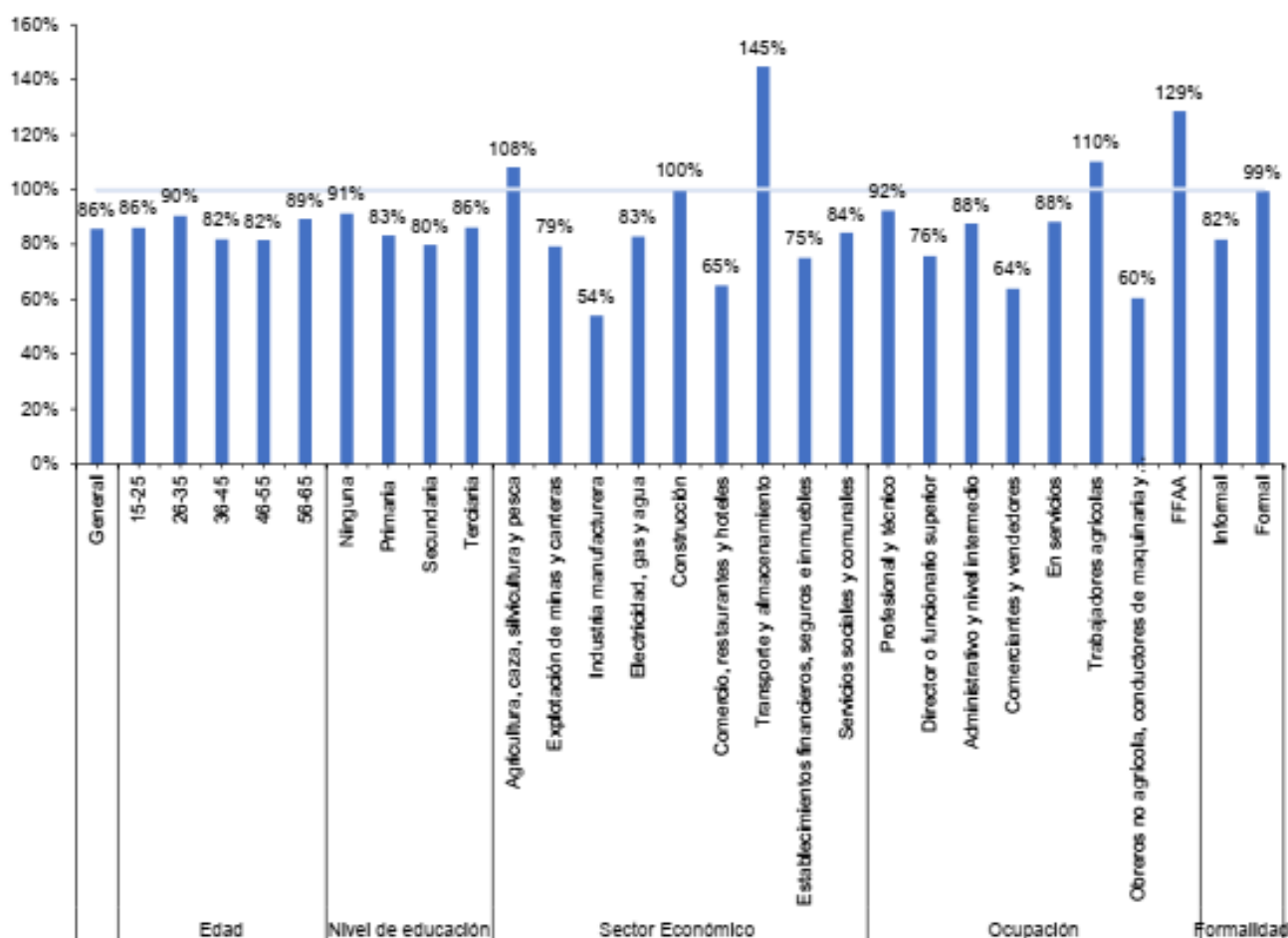
Furthermore, the crisis caused by COVID-19 has had a significant impact on women's labor force participation in the region. It is estimated that during 2020, 13 million women in the region lost their jobs, and the labor force participation rate of women decreased by 16 percentage points, compared to a decrease of 10 percentage points in the case of men. The crisis highlighted that women often work in more vulnerable sectors, exacerbating gender gaps and partially reversing the progress made (Bustelo, Suaya, and Vezza, 2021). Additionally, the concentration of women in part-time jobs deepened.

Currently, Peru ranks 37th out of 146 countries in the World Economic Forum's Global Gender Gap Index (WEF, 2022). In the Latin America and the Caribbean region, it ranks seventh out of 22 measured countries, with a score of 0.749 out of 1. Compared to 2006, when the index was first implemented and scored 0.6619, the country improved by 0.0871 points. Since then, Peru has climbed 23 positions, although it is important to note that in the first year of the index, only 115 countries were measured.

Specifically, in the areas of participation and economic opportunities, Peru ranks 86th, mainly due to the low labor force participation of women (ranked 61st) and income inequality between men and women performing similar jobs (ranked 115th). Regarding political representation, the country is in 27th place, with women holding 40% of the seats in parliament. In terms of educational achievements, Peru ranks 112th due to the persistence of illiteracy and dropout rates among women in secondary education.

¹ The study assesses the effect of gender inequalities in the Southern Cone countries of Latin America (Brazil, Chile, Paraguay, and Uruguay) and provides evidence on their economic consequences, drivers, and policy tools that can help mitigate them.

Graph 1. Hourly Labor Earnings of Women vs. Men in Peru in 2021*



Source: Author's own elaboration based on harmonized household surveys for Peru by the IDB.

*Only individuals with occupation and income were used.

The analyzed data from the Permanent Household Surveys in Peru, harmonized by the IDB, support these findings. As shown in Figure 1, in 2021, the average hourly earnings of women were equivalent to 86% of that of men. The most significant gender earnings gap was observed in the age group of 36 to 55 (82%), with primary education (83%), with secondary education (80%), in the manufacturing industry (54%), in the trade sector (64%), among non-agricultural workers and laborers (60%), and in the informal sector (82%)². Some results that might seem counterintuitive, such as women earning on average 145% of men's hourly income in the transportation and storage sector, can be explained by selection bias. As will be analyzed in more detail in the methodology section, when there are few women in a sector of the economy or in certain regions, it is common to observe that the few who enter do so in higher hierarchical positions and with better incomes. This can be attributed to the fact that women entering these sectors tend to have higher qualifications and, therefore, earn higher salaries. However, this type of analysis requires a specific methodology that differs from the one used in this study.

² Informal workers in Peru are considered those economically active individuals who are not affiliated to and do not contribute to the country's pension system.

Although the availability of information remains limited, the number of studies on this topic has increased significantly in recent years in Latin America and the world. In the case of Peru, the quantity of existing research papers is higher than the regional average, and most of them use the country's household surveys as a source of information. However, due to the different approaches to this issue, there is a recognized difficulty in comparing the results of various studies and tracking the evolution of the gender pay gap.

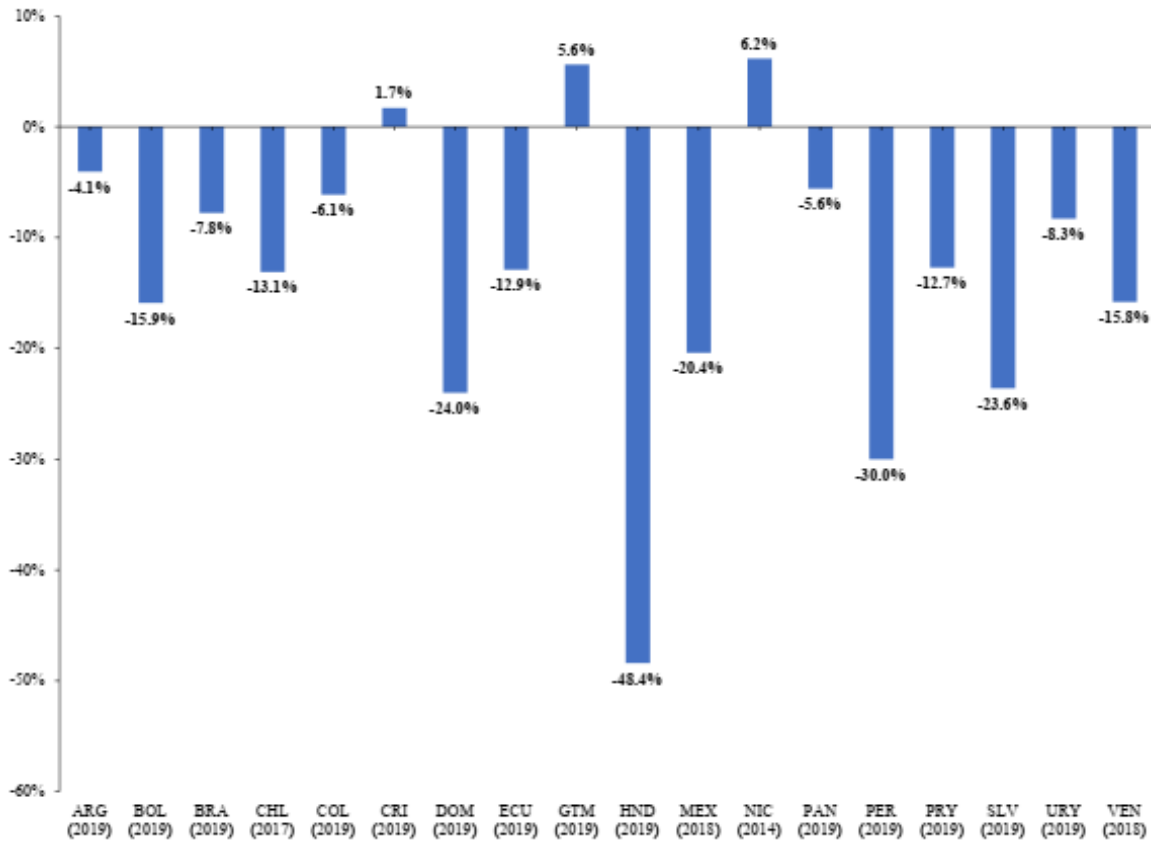
This study aims to enrich current knowledge about gender earnings disparity in Peru through a rigorous analysis of the pay gap's evolution from 1997 to 2021. Quesada and Ñopo (2022)³ in their analysis of the situation of women in Peru note that three-quarters of the monetary income of the vast majority of households comes from labor income⁴. This highlights the importance of labor income in supporting families, emphasizing the importance of understanding gender inequalities in such income. For the analysis of the Peruvian case, several previous studies have been referenced, including Urquidi, Valencia, and Durand (2021) on Bolivia; Urquidi, Chalup, and Durand (2022) on Paraguay; and Urquidi and Chalup (2023) on eighteen countries in the region. In addition, two analysis methodologies have been used: the Blinder-Oaxaca decomposition and the Ñopo decomposition. This implies that results from both a parametric and a non-parametric model will be obtained, allowing for year-to-year evolution comparisons, as well as comparisons between the methodologies themselves, with the aim of identifying more precisely the main variables influencing the earnings gap.

The previous regional study provides comparable information between countries (see Figure 1). This current analysis expands the age range of this data, tracks evolution over time, and provides information with greater geographical disaggregation for the country.

³ In this book the authors conduct an analysis that includes a review of the literature on gender inequality in various areas - gender-based violence, work, education, the judicial system, households, politics, and the impact of COVID-19 - in Peru. In addition, the authors propose policies and cultural changes to promote equal opportunities and improve the quality of life for women. It should be noted that this document does not present new estimates of the income gap, as analyzed in the current study.

⁴ The rest comes from incomes and transfers from the state or other households.

Figure 1. Total hourly labor earnings gap estimated using the Blinder-Oaxaca decomposition model.



Source: Urquidi and Chalup, 2023.

*Only individuals with occupation and income were considered.

The results of the analysis show that the earnings gap persists despite showing a decreasing trend over time. Most of this gap cannot be explained by observable variables obtained from household surveys, suggesting the presence of gender biases. It is also observed that this gap is more pronounced among informal sector workers. Additionally, there is an income disparity in favor of men in most occupations.

The gap cannot be explained by various control variables used, such as experience, personal and family characteristics, sector and economic activity, geographical location, and region of the country. Therefore, it is likely related to normative factors, biases, and/or discrimination (Becker, 1957). Possible factors that could contribute to this gap include normative aspects, cognitive biases, and labor costs related to childcare⁵ that are not visible in society.

The gender income gap has presented a narrowing trend during the analyzed period. Generally, this reduction is related to the explained gap and not to a reduction in the unexplained gap, which persists over time. This indicates the need for additional efforts to understand this disparity.

⁵ For strictly stylistic reasons, this document uses the unmarked inclusive masculine gender, regardless of individuals' sex or gender.

The present study is structured as follows. In the first section, a review of the literature related to the gender earning gap in Peru and Latin America and the Caribbean (LAC) is conducted. The second section describes the data used and presents descriptive statistics on the evolution of the earnings gap in Peru over the analyzed years. The third section provides brief descriptions of the methodologies used to estimate the gender earnings gap, while the fourth section presents the results of the analysis. Finally, in the fifth section, the study's conclusions and implications are discussed.

1. Literature Review

Regarding the gender pay gap, the literature has attempted to distinguish between that generated by differences in individual characteristics and human capital, and the unexplained portion, which is often primarily related to gender biases, prejudices, and discrimination (Atal, Ñopo, & Winder, 2009). In recent years, two predominant econometric techniques have been used in analyses based on permanent household surveys in various countries: (i) the Blinder-Oaxaca decomposition, introduced by Oaxaca (1973), and (ii) the Ñopo decomposition, presented more recently by Ñopo (2008)⁶.

Additionally, new studies have been conducted that have identified previously unanalyzed components contributing to the gender income gap. For example, the work of Kleven, Landais, and Sjøgaard (2019) focused on the penalty of motherhood and its impact on the income gap, using administrative data from Denmark. Ajayi et al. (2022) analyzed differences in socioemotional skills in the income gap in 17 African countries. Ammerman and Groysberg (2021) examined organizational obstacles and managerial actions contributing to the glass ceiling in women's professional development in the United States. Bustelo et al. (2021) focused on the effect of occupation and career selection on income, specifically in the case of Brazil, while Bordón, Canals, and Mizala (2020) did the same in the context of Chile.

In the Latin American context, Frisancho and Queijo (2022) compiled a series of studies that document the persistent gender inequalities in the countries of the Southern Cone of Latin America⁷. They also explored how reducing these gaps could drive economic growth and development in the region. These authors highlighted that gender gaps in access to public services, human capital accumulation, and the labor market limit overall productivity and economic growth. Therefore, they pointed out that policies aimed at mitigating these inequalities have the potential to promote economic development and well-being.

A previous analysis (Chioda, 2011) observed an increase in women's labor force participation in Latin America and the Caribbean starting in the 1980s. This increase was facilitated by economic growth, trade liberalization, urbanization, reduced fertility rates, and increased educational levels. However, Ñopo (2012) pointed out that women still tend to be overrepresented in informal and low-paying jobs, and the earnings gap remains significant.

A classic study on this topic is the one by Psacharopoulos and Tzannatos (1992), who studied the pay gap in 15 countries in Latin America and the Caribbean in the late 1980s. Their findings revealed that, for similar jobs, women earned on average 65% of what men earned. Moreover, they observed that approximately two-thirds of this difference could not be explained by educational level or human capital, suggesting the presence of normative factors, biases, or discrimination. It's important to note that, according to the literature, while the total earning gap has decreased, a significant portion of this reduction is due to the increased educational level of women, while the unexplained gap persists (Chioda, 2011; Gasparini and Marchionni, 2015).⁸

One of the most recent analyses in Latin America and the Caribbean on this topic was conducted by the International Labour Organization (ILO, 2019b). In this study, 17 countries were examined

⁶ These techniques are explained in detail in the third section.

⁷ Argentina, Brasil, Chile, Paraguay y Uruguay.

⁸ As can be seen in Table A1 in the annex, the average years of education for women increased from 9.7 to 11.9 between 1995 and 2021, while for men, it increased from 9.6 to 11.2 over the same period.

using Ñopo's (2008) decomposition technique to compare earnings among individuals with similar observable characteristics. It was found that the gender pay gap unexplained by gender decreased slightly between 2012 and 2017. It was also observed that this gap was generally larger for self-employed workers than for employees and increased when there were children under six years of age in the household or when it came to part-time or informal work. In the case of Peru, there was an overrepresentation of women at the lower ends of the earnings distribution, where the gap was wider, reaching almost 20%. Additionally, it was noted that in Peru, women's labor force participation rate was higher in rural areas than in urban areas, unlike in other countries.

Taking into account the previous findings, the ILO (2019a) conducted a similar study using the methodology of Firpo, Fortin, and Lemieux (2010), based on the classic Oaxaca-Blinder approach. Through an analysis of the explained and unexplained parts, results varied between countries. The explained part was related to differences in endowments, such as educational level, work experience, and age, among other factors, accompanied by professional polarization and segregation that tended to assign women to lower-paying occupations and industries. On the other hand, the unexplained part had a greater weight in determining the earnings gap, suggesting the existence of income discrimination against women.

Hoyos and Ñopo (2010) estimated gender earnings gaps in 18 Latin American countries between 1992 and 2007 using Ñopo's methodology. During this period, they observed an average decrease of 7% in the explained gap and 4% in the unexplained gap. The gap decreased mainly among workers who shared one or more of the following characteristics: were at the lower end of the earnings distribution, had children at home, were self-employed, worked part-time or lived in rural areas. These segments of the labor market previously exhibited more pronounced gender disparities. However, there was wide heterogeneity among countries, as the unexplained gap did not change in 12 of them, decreased in four, and increased in two.

In Peru, gender earnings gap analyses have been conducted since the 1980s using various methodologies. Ñopo (2009) used the matching methodology (Ñopo, 2008) with data from the National Household Surveys and the Specialized Employment Survey from 1986 to 2000. They found that when differences in endowments were not considered, the unexplained gap, usually interpreted as discrimination, was approximately 28% over the period. However, when combinations of age, education, experience, informality, occupation, and company size were included in the analysis, the unexplained part of the gap decreased to 25%.

Amaya and Mougenot (2019) studied the gap in the probability of high-income by gender for individuals with highly profitable professions, specifically focusing on doctors. They used the decomposition method by Ñopo (2008) and the ENSUSALUD survey, which collects data on healthcare providers working in public institutions⁹ and private clinics for the years 2014 and 2015. The authors found that the total gap in probability favored men by 81%, with the majority of the gap being unexplained (discrimination). When different combinations of characteristics were included, they observed that the explained gap increased from 18% to 25%, while the unexplained gap decreased from 62% to 47%.

Montes (2007) used the Oaxaca-Blinder decomposition (BO) to study the evolution of the gender gap in Peru, comparing data from the National Household Survey on Living Standards Measurement (ENNIV) for 1997 and 2000. They found that the overall gap decreased from 32.5%

⁹ Ministry of Health, Public Health Insurance System, and Army.

in 1997 to 19% in 2000. This study highlighted that during this period, men's wages remained constant, and the change in the composition of the labor market drove the reduction in the gaps¹⁰.

Quispe (2020) also used the B-O decomposition, but this time with data from the National Household Survey (ENAHO) for 2018. The analysis was divided into four sectors: (i) informal public sector, (ii) informal private sector, (iii) formal public sector, and (iv) formal private sector. In the first case, they found a pay gap of 28%, of which 76% was attributed to discrimination. In the second case¹¹, the pay gap was 21%, and 101.6% of the gap was attributed to discrimination, suggesting the importance of personal characteristics in reducing the gap. In the third case, the gap was marginally positive for women, attributed to their higher level of education, as the explained part of the gap due to characteristics was 7.2% in favor of women, while the unexplained part was 4.4% in favor of men. In the last case, the gap was 17.9%, and 115.4% of this figure was attributed to discrimination. Additionally, the author found, through Melly's methodology (2006), that the distribution had an inverted U-shape, indicating that the gap was larger at the lower and higher percentiles, demonstrating the existence of glass ceilings¹² and sticky floors¹³.

Meléndez and colleagues (2021) analyzed the earnings gap in Peru for the period 2015-2019 using the B-O decomposition and ENAHO data, both for salaried workers and self-employed workers. They found that the overall gap decreased from 42.7% in 2015 to 34.4% in 2019. When looking only at salaried workers, the gap decreased from 23.2% to 20.8%, while for self-employed workers, the gap decreased from 64.5% in 2015 to 48.8% in 2019. Additionally, the authors observed that the earnings gap was more pronounced at the extremes of the distribution, with 7.5% at the first decile and 16.9% at the tenth decile in 2015. However, these percentages varied in 2019, with 19.3% at the first decile and 4.0% at the tenth decile. Despite this decrease, evidence of glass ceilings and sticky floors was found in the country.

In a more recent analysis, Saco et al. (2022) analyzed the gap over a longer period, from 2004 to 2019, using ENAHO data and the B-O decomposition for three different models. The first model used a basic set of characteristics¹⁴ as regressors, while the second model added personal characteristics such as work experience or having social security, among others¹⁵. Model 3 included two additional variables compared to model 2, head of household and recipient of intergenerational private transfers, which aimed to capture gender stereotypes. The authors found that the percentage of the earnings gap explained by characteristics increased from one model to another, from 44.4% in model 1 to 51.5% in model 2. This led to the conclusion that, even when controlling for characteristics, approximately half of the difference in labor income

¹⁰ Young women with lower education and experience exited the labor market, while older women with higher education and 10 or more years of experience entered.

¹¹ It is the second segment with the widest gender pay gap, and it is also the largest segment in the sample since the majority of the population consists of microentrepreneurs.

¹² Unobservable barriers that limit the career advancement of women with higher endowments (more accumulation of human capital in the case of Peru) in the upper part of the labor income distribution (Guy, 1994).

¹³ A scenario where women have lower-level jobs, similar to being stuck, with barriers to achieving labor mobility (Guy, 1994).

¹⁴ Age, region, employment status, education, having a pension, affiliation with a pension plan, native language, and region.

¹⁵ Work experience, social pension (P65), having other pensions, marital status, number of household members, health insurance, and chronic illness.

could be attributed to discrimination. However, with model 3, they found that 71.1% of the earnings gap was explained by characteristics, and the inclusion of the two variables captured the country's gender social norms, affecting the gap and allowing the unexplained percentage (discrimination) to decrease.

Vaccaro and colleagues (2022) analyzed the evolution of the earnings gap using the B-O decomposition, Fortin's extension (2008), and Machado and Mata's decomposition (2005), using ENAHO data for the period 2007-2018. The authors found that the overall gap showed a positive trend between 2007 and 2011, fluctuating between 6% and 12%, and then remained around 12% in the following years. Through the B-O decomposition, they observed that the percentage of the earnings gap attributable to discrimination did not show variations over time and remained at approximately 17%. This suggests that there are structural problems in terms of social norms and gender stereotypes that may contribute to the increase in the overall gap. Additionally, the authors found that the earnings gap was greater at the lower percentiles, indicating the presence of glass ceilings and sticky floors, both nationally and regionally.

Finally, when analyzed by region, a smaller gap was associated with a higher Gross Domestic Product (GDP), lower levels of domestic physical violence against women, and lower percentages of women as heads of households.

It is clear that the analysis of the gender earnings gap in Peru, over time, finds that perception and social norms play an important role when analyzing the pay gap, as does the sector to which individuals belong¹⁶. Additionally, there is substantial evidence of the existence of glass ceilings and/or sticky floors, opening up the possibility of improving the development, management, and implementation of public policies with the aim of increasing the welfare of the population.

¹⁶ Formal or informal, public or private.

2. Data and Descriptive Statistics

The study relies on data obtained from harmonized household surveys by the Inter-American Development Bank (IDB). These surveys were conducted in consecutive years between 1997 and 2021. The year 1997 was chosen as the first year for which harmonized data including information from the National Household Survey (ENAHO) in Peru were available. For the data to be comparable over the years and across different countries in Latin America and the Caribbean, a data harmonization process was required, which was carried out by the IDB's data harmonization system.

The surveys have a similar design and level of representativeness for different years, as they are representative of the total population of Peru and collect data from the country's main regions¹⁷. The Table 1 shows the selected sample for individuals aged 15 to 65, which is the age range used in the analysis for each of the years, along with their representativeness in the total population of Peru.¹⁸ The analysis is disaggregated by gender and age group.

The sample appears to be highly representative of the population it aims to represent, with proportions very close to the proportions of the population in terms of gender and age group. The distribution of the sample between genders is equitable, and the variations in the proportions of age groups follow the aging trend of the population observed in both Peru and most countries in Latin America and the Caribbean.

Furthermore, there is a gradual increase in the number of samples over time, reflecting population growth.

Table 2 presents an estimation of hourly earnings for women compared to that of men¹⁹. This analysis is broken down by age group, educational level, economic activity, occupation, labor formality, geographical area, self-employed worker status, and regions. In Annex A1, the distribution of the characteristics of the employed population earning income is presented, broken down by year and gender, providing an overview of the characteristics of both men and women in the active population.

¹⁷ The regions included in the survey are Amazonas, Ancash, Apurímac, Arequipa, Ayacucho, Cajamarca, Callao, Cusco, Huancavelica, Huánuco, Ica, Junín, La Libertad, Lambayeque, Lima, Loreto, Madre de Dios, Moquegua, Pasco, Piura, Puno, San Martín, Tacna, Tumbes, and Ucayali.

¹⁸ Frequency weightings are used.

¹⁹ Labor income from the main activity and frequency weightings are used.

Table 1. Number of observations in the surveys and their representativeness by gender and age group

	1997		1998		1999		2000		2001		2002		2003		2004	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Gender																
Men	8.865	49%	9.584	49%	4.979	49%	5.003	49%	21.597	49%	24.765	49%	16.990	49%	26.884	50%
Representativity	7.276.896	48%	74.530.603	48%	7.675.526	48%	7.811.486	48%	7.886.127	49%	8.190.762	49%	8.413.365	49%	8.754.990	49%
Women	9.325	51%	10.025	51%	5.249	51%	5.285	51%	22.050	51%	25.463	51%	17.506	51%	27.063	50%
Representativity	7.819.345	52%	80.286.786	52%	8.232.838	52%	8.349.807	52%	8.130.390	51%	8.578.955	51%	8.792.712	51%	9.045.813	51%
Age																
15-25	6.828	38%	7.312	37%	3.736	37%	3.728	36%	15.168	35%	17.541	35%	12.175	35%	19.059	35%
Representativity	5.564.113	37%	55.477.138	36%	5.724.514	36%	5.718.510	35%	5.515.147	34%	5.727.115	34%	5.880.568	34%	6.161.741	35%
26-35	4.224	23%	4.459	23%	2.257	22%	2.441	24%	10.185	23%	11.763	23%	7.785	23%	11.772	22%
Representativity	3.532.498	23%	35.881.881	23%	3.554.970	22%	3.974.191	25%	3.774.257	24%	3.969.811	24%	3.989.107	23%	3.903.280	22%
36-45	3.309	18%	3.678	19%	1.958	19%	1.860	18%	8.477	19%	9.626	19%	6.497	19%	10.321	19%
Representativity	2.751.049	18%	29.678.339	19%	3.035.984	19%	2.804.026	17%	3.023.431	19%	3.222.090	19%	3.247.493	19%	3.398.628	19%
46-55	2.144	12%	2.442	12%	1.306	13%	1.299	13%	5.810	13%	6.632	13%	4.796	14%	7.468	14%
Representativity	1.841.417	12%	19.935.791	13%	2.073.024	13%	2.123.029	13%	2.193.661	14%	2.284.704	14%	2.455.029	14%	2.545.201	14%
56-65	1.685	9%	1.718	9%	971	9%	960	9%	4.007	9%	4.666	9%	3.243	9%	5.327	10%
Representativity	1.407.164	9%	13.844.240	9%	1.519.872	10%	1.541.537	10%	1.510.021	9%	1.565.997	9%	1.633.880	9%	1.791.953	10%
Total	18.190	100%	19.609	100%	10.228	100%	10.288	100%	43.647	100%	50.228	100%	34.496	100%	53.947	100%
Representativity	15.096.241	100%	15.481.739	100%	15.908.364	100%	16.161.293	100%	16.016.517	100%	16.769.717	100%	17.206.077	100%	17.800.803	100%
	2005		2006		2007		2008		2009		2010		2011		2012	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Gender																
Men	26.658	50%	27.778	50%	28.778	49%	28.114	49%	28.597	50%	28.027	49%	31.732	49%	31.696	49%
Representativity	8.770.081	49%	8.965.183	49%	8.983.366	49%	9.263.852	48%	9.472.878	49%	9.585.580	49%	9.688.084	49%	9.992.693	49%
Women	26.987	50%	27.996	50%	29.708	51%	28.921	51%	29.145	50%	28.848	51%	32.766	51%	32.751	51%
Representativity	9.138.117	51%	9.266.411	51%	9.514.544	51%	9.866.375	52%	9.945.969	51%	10.160.470	51%	10.248.586	51%	10.534.589	51%
Age																
15-25	18.839	35%	19.360	35%	19.630	34%	19.041	33%	19.149	33%	18.721	33%	20.831	32%	20.603	32%
Representativity	6.043.858	34%	6.150.103	34%	5.995.601	32%	6.236.917	33%	6.245.201	32%	6.255.362	32%	6.293.405	32%	6.414.198	31%
26-35	11.685	22%	12.036	22%	13.140	22%	12.477	22%	12.413	21%	11.913	21%	12.936	20%	12.441	19%
Representativity	3.986.351	22%	3.991.986	22%	4.213.843	23%	4.225.834	22%	4.265.319	22%	4.258.060	22%	4.061.790	20%	3.969.770	19%
36-45	10.172	19%	10.778	19%	11.478	20%	11.235	20%	11.287	20%	11.007	19%	12.626	20%	12.680	20%
Representativity	3.360.299	19%	3.482.378	19%	3.654.419	20%	3.749.480	20%	3.750.190	19%	3.823.780	19%	3.848.703	19%	4.021.718	20%
46-55	7.603	14%	8.076	14%	8.544	15%	8.548	15%	9.034	16%	9.073	16%	10.608	16%	11.031	17%
Representativity	2.670.084	15%	2.731.417	15%	2.773.473	15%	2.921.372	15%	3.127.481	16%	3.231.099	16%	3.333.571	17%	3.594.932	18%
56-65	5.346	10%	5.524	10%	5.694	10%	5.734	10%	5.859	10%	6.161	11%	7.497	12%	7.692	12%
Representativity	1.847.606	10%	1.875.710	10%	1.860.574	10%	1.996.624	10%	2.030.656	10%	2.177.749	11%	2.399.201	12%	2.526.664	12%
Total	53.645	100%	55.774	100%	58.486	100%	57.035	100%	57.742	100%	56.875	100%	64.498	100%	64.447	100%
Representativity	17.908.198	100%	18.231.594	100%	18.497.910	100%	19.130.227	100%	19.418.847	100%	19.746.050	100%	19.936.670	100%	20.527.282	100%

Table 1 (Continuation)

	2013		2014		2015		2016		2017		2018		2019		2020		2021		
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Gender																			
Men	37.586	49%	37.239	49%	37.358	49%	41.032	48%	38.994	49%	41.262	48%	37.861	48%	37.947	48%	35.689	48%	
Representativity	10.112.373	49%	10.136.561	48%	10.086.278	48%	10.250.097	48%	10.254.972	48%	10.282.123	48%	10.398.588	48%	10.603.748	48%	10.615.705	48%	
Women	39.185	51%	39.172	51%	39.283	51%	43.605	52%	41.396	51%	43.986	52%	40.539	52%	40.586	52%	39.030	52%	
Representativity	10.646.419	51%	10.843.867	52%	10.807.551	52%	10.887.480	52%	10.999.830	52%	11.135.354	52%	11.286.672	52%	11.385.568	52%	11.666.923	52%	
Age																			
15-25	23.703	31%	23.144	30%	22.543	29%	24.334	29%	22.515	28%	23.448	28%	21.462	27%	21.643	28%	20.355	27%	
Representativity	6.324.375	30%	6.303.703	30%	6.084.983	29%	6.069.056	29%	6.020.640	28%	5.935.407	28%	5.968.155	28%	6.123.458	28%	6.057.801	27%	
26-35	14.520	19%	14.280	19%	15.475	20%	16.967	20%	15.858	20%	16.414	19%	14.952	19%	15.019	19%	14.700	20%	
Representativity	4.047.746	19%	4.069.093	19%	4.304.937	21%	4.292.994	20%	4.252.973	20%	4.227.684	20%	4.202.126	19%	4.307.486	20%	4.503.268	20%	
36-45	15.166	20%	15.114	20%	15.404	20%	16.986	20%	15.992	20%	16.985	20%	15.807	20%	15.633	20%	14.828	20%	
Representativity	4.118.590	20%	4.111.109	20%	4.182.397	20%	4.270.341	20%	4.206.466	20%	4.256.851	20%	4.356.787	20%	4.377.151	20%	4.453.567	20%	
46-55	13.613	18%	13.789	18%	13.383	17%	14.937	18%	14.675	18%	15.857	19%	14.536	19%	14.868	19%	13.809	18%	
Representativity	3.620.493	17%	3.724.409	18%	3.597.205	17%	3.674.398	17%	3.815.681	18%	3.890.726	18%	3.961.432	18%	4.077.964	19%	4.065.915	18%	
56-65	9.769	13%	10.084	13%	9.836	13%	11.413	13%	11.350	14%	12.544	15%	11.643	15%	11.370	14%	11.027	15%	
Representativity	2.647.588	13%	2.772.114	13%	2.724.307	13%	2.830.788	13%	2.959.042	14%	3.106.809	15%	3.196.760	15%	3.103.257	14%	3.202.077	14%	
Total	76.771	100%	76.411	100%	76.641	100%	84.637	100%	80.390	100%	85.248	100%	78.400	100%	78.533	100%	74.719	100%	
Representativity	20.758.792	100%	20.980.428	100%	20.893.829	100%	21.137.577	100%	21.254.802	100%	21.417.477	100%	21.685.260	100%	21.989.316	100%	22.282.628	100%	

Source: Own elaboration based on the household surveys of Peru harmonized by the IDB

Table 2. Hourly earnings of women vs. men*

	1997	1998	1999	2000	2001	2002	2003	2004
General	75,6%	74,7%	86,2%	73,2%	85,0%	83,2%	76,2%	73,7%
Edad								
15-25	72,7%	74,7%	86,3%	97,1%	85,1%	105,1%	96,5%	81,3%
26-35	85,1%	81,0%	126,0%	88,8%	103,7%	106,6%	80,9%	85,6%
36-45	78,9%	83,0%	98,5%	68,7%	72,4%	77,9%	79,7%	79,4%
46-55	67,7%	61,0%	65,4%	51,0%	78,1%	60,3%	61,2%	56,7%
56-65	48,8%	52,6%	30,7%	47,8%	67,8%	62,9%	66,3%	59,0%
Level of Education								
None	92,3%	103,0%	92,5%	60,4%	93,4%	95,2%	80,4%	83,0%
Primary	69,1%	61,6%	93,9%	83,8%	83,0%	77,1%	83,8%	72,6%
Secondary	81,5%	77,1%	85,5%	67,8%	88,8%	81,8%	76,7%	73,2%
Tertiary	69,1%	72,2%	79,6%	72,0%	72,8%	73,0%	65,0%	69,3%
Economic Sector								
Agriculture, hunting, forestry, and fishing	78,2%	82,6%	66,9%	46,0%	67,6%	73,2%	68,1%	84,4%
Mining and quarrying	121,6%	54,2%	63,2%	125,6%	262,7%	113,4%	149,8%	58,9%
Manufacturing industry	52,6%	57,8%	82,7%	66,8%	62,4%	42,6%	44,9%	49,9%
Electricity, gas, and water	113,6%	215,6%	78,5%	42,0%	117,4%	93,8%	30,2%	107,1%
Construction	76,6%	85,4%	100,2%	26,5%	62,5%	558,2%	322,1%	116,5%
Trade, restaurants, and hotels	62,3%	48,3%	79,4%	63,9%	59,5%	61,9%	56,7%	58,5%
Transport and storage	118,5%	155,1%	232,3%	86,2%	124,7%	238,3%	279,3%	129,2%
Financial establishments, insurance, and real estate	112,1%	91,4%	72,5%	192,3%	164,1%	87,7%	94,2%	110,8%
Social and community services	62,0%	70,9%	67,7%	76,8%	78,6%	71,8%	61,8%	67,0%
Occupation								
Professional and technician	72,8%	76,8%	98,0%	79,3%	73,5%	76,3%	67,8%	73,7%
Director or senior official	91,9%	61,4%	25,4%	54,1%	137,6%	49,9%	32,9%	28,7%
Administrative and intermediate level	71,8%	75,8%	100,7%	83,6%	68,3%	81,1%	75,4%	74,6%
Merchants and salespersons	67,1%	51,6%	89,8%	80,9%	66,2%	68,2%	58,5%	59,3%
In services	58,4%	75,7%	71,1%	63,7%	104,8%	73,7%	66,2%	64,7%
Agricultural workers	77,5%	81,5%	65,9%	46,1%	68,9%	79,6%	68,1%	87,6%
Non-agricultural laborers, machinery operators, and transport services	48,5%	55,1%	57,7%	52,7%	55,3%	55,5%	66,3%	58,1%
Armed Forces	115,5%	37,9%	160,6%	122,6%	96,8%	96,4%	135,1%	96,3%
Formality								
Informal	70,3%	71,2%	81,5%	72,6%	82,4%	79,0%	78,0%	73,4%
Formal	94,9%	90,9%	105,6%	81,5%	98,1%	99,1%	84,1%	84,7%
Area								
Rural	78,6%	74,8%	77,7%	56,8%	80,0%	91,1%	82,4%	77,1%
Urban	69,9%	68,6%	79,0%	71,7%	77,7%	73,6%	68,5%	66,9%
Self-Employed								
Not self-employed	79,0%	77,3%	88,8%	80,6%	86,0%	83,2%	79,7%	74,8%
Self-employed	85,2%	84,7%	89,9%	72,0%	94,7%	92,9%	79,1%	81,9%
Regions								
Amazonas	94,8%	69,4%	111,6%	90,0%	100,9%	96,8%	77,0%	85,8%
Ancash	95,8%	58,4%	70,2%	62,8%	74,8%	80,0%	73,6%	67,4%
Apurímac	79,5%	76,6%	40,2%	52,3%	94,1%	90,9%	133,4%	84,3%
Arequipa	74,6%	65,8%	58,7%	60,7%	49,6%	85,3%	66,0%	60,2%
Ayacucho	123,1%	96,0%	85,9%	51,9%	90,5%	89,4%	75,4%	80,3%
Cajamarca	74,1%	86,5%	82,2%	63,5%	75,6%	91,7%	81,0%	79,7%
Callao	86,7%	77,4%	83,3%	62,2%	76,0%	78,0%	84,0%	97,5%
Cusco	109,3%	84,7%	114,1%	134,1%	101,6%	102,3%	69,0%	86,3%
Huancavelica	103,4%	76,6%	51,5%	73,4%	73,6%	105,9%	65,4%	76,6%
Huánuco	80,5%	106,2%	64,2%	65,2%	114,3%	86,9%	103,6%	89,7%
Ica	66,8%	69,8%	75,1%	108,1%	92,2%	82,4%	59,1%	47,6%
Junín	78,1%	62,0%	76,6%	53,7%	143,0%	88,4%	59,8%	65,1%
La libertad	85,3%	71,3%	108,0%	62,4%	91,2%	66,6%	58,7%	73,1%
Lambayeque	84,8%	60,9%	77,2%	78,5%	69,9%	88,4%	83,6%	76,4%
Lima	67,2%	70,1%	78,0%	69,7%	75,0%	73,0%	70,0%	66,5%
Loreto	69,0%	66,9%	78,6%	99,8%	200,4%	80,3%	100,3%	101,0%
Madre de Dios	74,5%	91,3%	73,8%	11,4%	57,6%	73,3%	71,3%	78,1%
Moquegua	78,7%	67,8%	87,7%	67,3%	71,5%	77,3%	63,6%	52,3%
Pasco	66,9%	89,0%	119,1%	49,8%	57,0%	60,6%	109,5%	70,8%
Piura	62,7%	61,5%	136,4%	92,2%	73,8%	69,9%	85,3%	70,6%
Puno	52,5%	69,7%	60,3%	68,3%	71,8%	84,9%	59,6%	68,8%
San Martín	69,6%	117,7%	103,7%	102,7%	117,5%	100,3%	105,3%	88,5%
Tacna	73,1%	70,7%	55,4%	68,9%	90,2%	68,7%	64,5%	63,8%
Tumbes	85,4%	102,7%	108,6%	86,5%	98,0%	98,9%	79,4%	83,3%
Ucayali	74,2%	67,1%	109,7%	137,6%	79,6%	105,5%	114,1%	75,9%

Table 2 (Continuation).

	2005	2006	2007	2008	2009	2010	2011	2012
General	80,7%	77,3%	82,4%	74,6%	78,5%	74,5%	75,3%	72,4%
Edad								
15-25	62,3%	76,6%	79,5%	80,1%	81,5%	79,5%	75,7%	72,3%
26-35	99,0%	99,9%	89,6%	81,9%	87,6%	84,6%	89,0%	79,3%
36-45	81,1%	81,0%	86,1%	74,0%	78,8%	73,3%	73,7%	65,7%
46-55	78,0%	57,7%	79,2%	67,8%	76,3%	65,4%	71,1%	74,2%
56-65	64,6%	63,8%	67,0%	63,3%	56,2%	64,9%	60,2%	68,0%
Level of Education								
None	85,9%	76,6%	71,1%	70,3%	70,0%	71,6%	75,9%	73,6%
Primary	84,3%	73,9%	68,8%	71,3%	70,0%	76,4%	76,4%	69,4%
Secondary	78,5%	73,5%	80,7%	79,7%	80,7%	73,4%	73,7%	67,8%
Tertiary	71,9%	75,5%	85,7%	70,2%	77,4%	75,8%	72,9%	72,6%
Economic Sector								
Agriculture, hunting, forestry, and fishing	84,3%	64,9%	65,1%	59,0%	69,7%	59,2%	65,7%	77,1%
Mining and quarrying	163,0%	49,9%	148,6%	82,4%	129,9%	81,8%	163,8%	106,1%
Manufacturing industry	64,2%	60,3%	63,1%	62,7%	74,8%	58,2%	62,0%	65,8%
Electricity, gas, and water	149,8%	97,7%	96,2%	57,2%	55,5%	128,5%	64,9%	141,6%
Construction	146,0%	639,8%	109,0%	235,7%	122,0%	97,6%	172,4%	97,8%
Trade, restaurants, and hotels	59,8%	63,3%	63,3%	61,6%	66,1%	65,5%	66,5%	59,7%
Transport and storage	161,9%	114,4%	214,9%	108,8%	120,0%	83,1%	126,6%	127,2%
Financial establishments, insurance, and real estate	134,1%	87,6%	143,1%	72,0%	91,9%	87,0%	55,7%	70,6%
Social and community services	66,3%	68,6%	72,8%	68,8%	68,4%	71,3%	65,9%	67,2%
Occupation								
Professional and technician	76,2%	73,7%	85,3%	73,6%	78,6%	80,3%	69,3%	69,8%
Director or senior official	142,2%	81,8%	57,9%	49,4%	89,2%	43,7%	66,7%	65,2%
Administrative and intermediate level	69,5%	87,8%	87,8%	76,5%	84,3%	90,6%	87,4%	79,2%
Merchants and salespersons	53,6%	62,4%	68,8%	60,0%	66,5%	68,3%	62,8%	55,7%
In services	79,3%	70,9%	69,4%	72,9%	73,3%	73,0%	80,1%	72,6%
Agricultural workers	85,7%	66,1%	70,5%	59,2%	74,4%	59,5%	66,7%	80,3%
Non-agricultural laborers, machinery operators, and transport services	61,1%	55,8%	50,0%	62,8%	63,5%	55,4%	61,3%	62,6%
Armed Forces	133,9%	111,1%	87,9%	113,0%	73,9%	101,3%	82,6%	100,8%
Formality								
Informal	80,5%	74,1%	77,2%	74,9%	75,7%	70,7%	71,1%	67,8%
Formal	98,5%	98,7%	109,7%	84,8%	97,1%	95,0%	92,3%	91,1%
Area								
Rural	79,9%	65,8%	69,9%	64,8%	67,8%	76,3%	68,3%	68,2%
Urban	74,0%	72,0%	77,9%	71,3%	75,2%	70,6%	72,7%	69,6%
Self-Employed								
Not self-employed	79,4%	81,5%	85,8%	77,0%	83,6%	77,2%	77,4%	78,9%
Self-employed	95,6%	78,7%	86,3%	78,8%	78,3%	78,0%	78,6%	66,2%
Regions								
Amazonas	72,4%	62,5%	59,0%	69,8%	57,9%	66,5%	88,8%	56,6%
Ancash	71,2%	73,5%	85,4%	66,6%	74,4%	60,4%	88,7%	68,4%
Apurímac	143,3%	99,2%	103,3%	128,2%	116,3%	100,9%	74,6%	106,6%
Arequipa	70,8%	79,3%	76,9%	63,6%	62,4%	74,5%	67,5%	57,7%
Ayacucho	91,9%	80,9%	77,7%	73,3%	66,8%	140,2%	67,6%	91,2%
Cajamarca	75,7%	64,3%	80,2%	67,1%	70,8%	60,5%	65,9%	62,5%
Callao	83,5%	79,3%	85,3%	80,0%	72,6%	74,2%	66,2%	74,1%
Cusco	83,2%	79,4%	90,3%	83,1%	79,8%	89,2%	89,5%	71,2%
Huancavelica	83,6%	97,6%	92,6%	93,7%	87,5%	76,2%	91,2%	64,6%
Huánuco	84,9%	104,6%	86,5%	58,7%	85,2%	70,1%	85,0%	100,4%
Ica	62,7%	55,1%	78,8%	76,8%	83,1%	66,8%	78,8%	73,7%
Junín	75,7%	66,0%	86,0%	58,3%	72,2%	75,3%	63,0%	66,8%
La libertad	77,2%	67,8%	112,9%	65,7%	68,9%	73,3%	85,9%	76,2%
Lambayeque	128,3%	63,1%	51,4%	62,5%	74,3%	66,9%	67,6%	71,3%
Lima	80,8%	76,9%	80,1%	76,1%	79,7%	71,9%	74,8%	74,0%
Loreto	88,4%	76,7%	74,6%	87,0%	80,0%	71,8%	97,9%	58,1%
Madre de Dios	76,4%	67,8%	67,0%	61,6%	110,6%	124,9%	62,6%	44,8%
Moquegua	60,7%	50,9%	56,4%	40,3%	46,1%	45,5%	47,3%	55,4%
Pasco	73,4%	86,0%	78,1%	62,5%	56,8%	50,9%	52,9%	66,9%
Piura	72,2%	68,7%	68,8%	67,7%	91,9%	73,7%	86,1%	77,5%
Puno	73,9%	72,1%	67,7%	65,5%	56,8%	65,2%	49,6%	67,6%
San Martín	87,4%	86,1%	68,7%	73,1%	73,3%	79,8%	66,9%	51,2%
Tacna	59,0%	57,3%	75,2%	67,7%	68,3%	70,3%	77,8%	83,5%
Tumbes	60,9%	57,1%	70,5%	64,8%	68,7%	94,3%	74,9%	65,7%
Ucayali	25,0%	84,7%	68,2%	84,4%	76,1%	97,0%	75,0%	89,1%

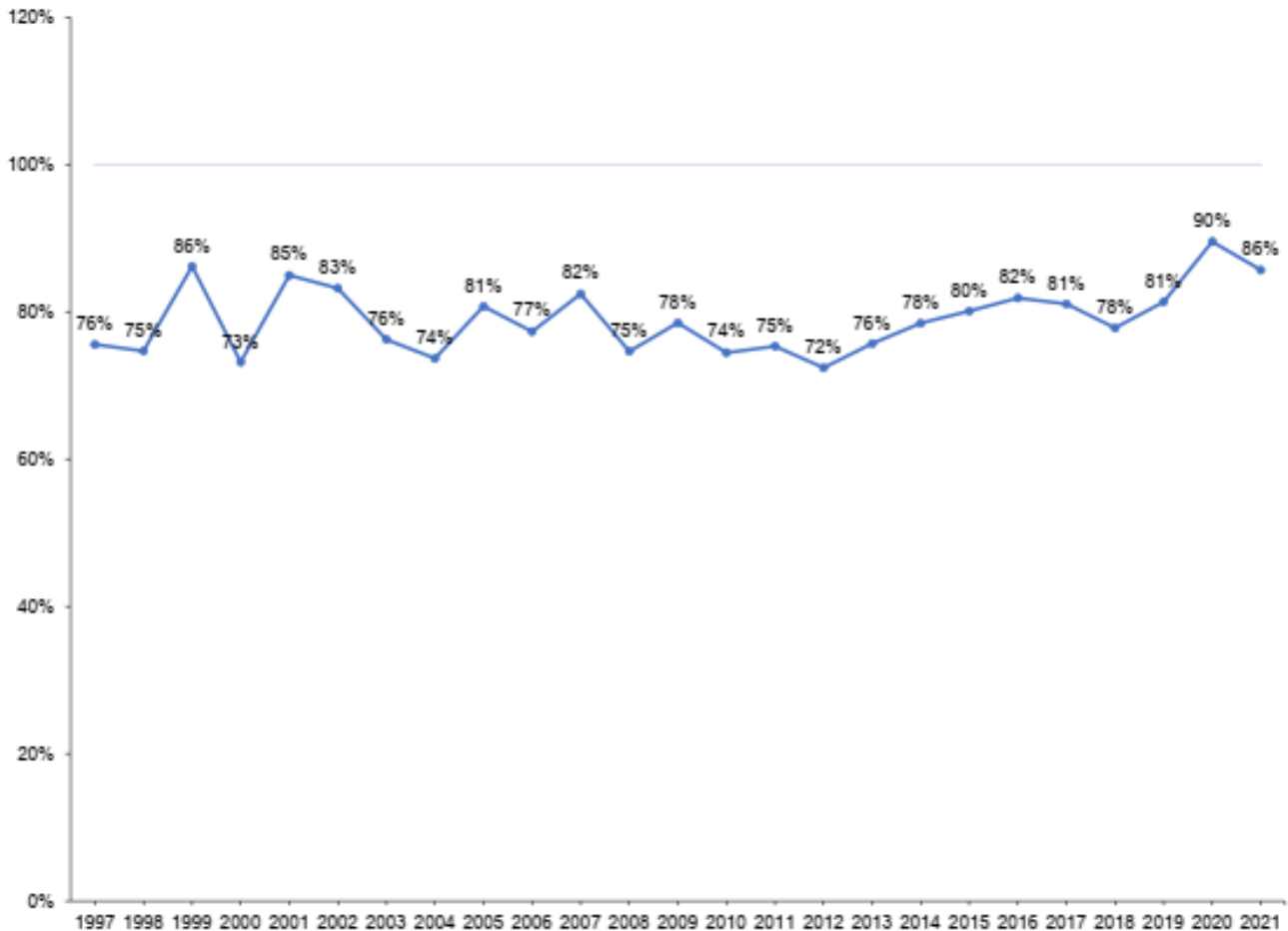
Table 2 (Continuation).

	2013	2014	2015	2016	2017	2018	2019	2020	2021
General	75,7%	78,4%	80,1%	81,9%	81,1%	77,8%	81,3%	89,5%	85,7%
Edad									
15-25	82,1%	92,1%	88,5%	84,6%	84,6%	82,6%	91,3%	96,0%	86,0%
26-35	83,3%	85,5%	85,1%	86,7%	83,0%	82,6%	86,5%	82,6%	90,4%
36-45	71,9%	71,8%	77,0%	83,4%	87,5%	75,6%	88,8%	89,0%	81,8%
46-55	70,4%	77,5%	81,9%	83,7%	74,9%	76,1%	86,5%	96,3%	81,6%
56-65	70,2%	64,6%	64,6%	64,7%	71,4%	71,9%	73,8%	83,8%	89,3%
Level of Education									
None	77,2%	79,8%	77,2%	85,9%	82,5%	76,7%	78,1%	94,1%	91,2%
Primary	72,4%	70,8%	82,0%	78,5%	79,5%	77,8%	79,6%	91,4%	83,3%
Secondary	73,0%	76,1%	77,8%	82,1%	81,3%	73,5%	82,7%	81,5%	79,8%
Tertiary	77,0%	78,4%	76,5%	78,7%	78,2%	82,0%	78,7%	87,4%	86,2%
Economic Sector									
Agriculture, hunting, forestry, and fishing	62,2%	60,0%	69,0%	68,6%	66,9%	79,2%	89,4%	86,6%	108,1%
Mining and quarrying	72,9%	167,2%	114,8%	110,7%	77,6%	79,0%	98,4%	142,4%	79,3%
Manufacturing industry	56,9%	58,4%	69,4%	67,0%	67,3%	56,4%	60,9%	54,2%	54,1%
Electricity, gas, and water	90,3%	56,0%	103,3%	70,0%	139,8%	114,8%	79,5%	138,9%	82,8%
Construction	150,4%	139,6%	138,7%	202,5%	114,4%	129,9%	98,8%	102,8%	100,2%
Trade, restaurants, and hotels	59,2%	65,9%	64,5%	62,2%	66,9%	60,7%	70,0%	72,9%	65,0%
Transport and storage	112,1%	140,0%	135,5%	219,1%	138,3%	113,1%	113,0%	124,2%	144,7%
Financial establishments, insurance, and real estate	100,2%	127,1%	77,3%	80,5%	87,8%	93,1%	81,1%	76,3%	75,1%
Social and community services	79,8%	72,9%	76,5%	74,4%	77,4%	74,3%	78,4%	85,4%	84,3%
Occupation									
Professional and technician	81,8%	82,4%	84,5%	74,5%	85,6%	78,1%	81,9%	88,9%	92,3%
Director or senior official	71,0%	65,6%	61,5%	93,3%	77,5%	85,7%	101,6%	114,1%	75,7%
Administrative and intermediate level	90,9%	77,2%	91,3%	84,3%	83,1%	84,8%	80,8%	64,7%	87,6%
Merchants and salespersons	58,0%	65,1%	59,2%	65,5%	65,5%	62,8%	65,5%	76,2%	63,9%
In services	80,0%	78,1%	73,2%	94,7%	87,9%	82,1%	86,6%	89,0%	88,2%
Agricultural workers	63,8%	63,7%	65,6%	69,5%	67,9%	81,7%	91,1%	88,5%	110,1%
Non-agricultural laborers, machinery operators, and transport services	53,1%	60,4%	65,2%	61,7%	62,8%	57,8%	59,3%	66,8%	60,4%
Armed Forces	95,0%	103,9%	97,5%	92,0%	89,7%	94,0%	105,1%	112,0%	128,5%
Formality									
Informal	73,0%	73,1%	76,2%	75,1%	76,1%	73,7%	79,7%	85,9%	81,7%
Formal	91,0%	96,7%	93,6%	102,3%	98,7%	93,2%	91,5%	96,9%	99,3%
Area									
Rural	66,4%	66,8%	69,1%	66,2%	61,5%	76,8%	80,1%	89,3%	97,0%
Urban	73,7%	76,1%	77,6%	79,7%	79,5%	74,9%	78,5%	85,7%	81,9%
Self-Employed									
Not self-employed	81,2%	83,2%	83,7%	87,7%	87,5%	79,9%	85,4%	95,8%	91,4%
Self-employed	72,8%	76,8%	79,1%	76,7%	74,3%	80,3%	79,8%	85,6%	85,0%
Regions									
Amazonas	101,3%	78,4%	72,9%	78,9%	75,4%	95,0%	107,0%	93,0%	84,1%
Ancash	79,3%	76,9%	63,4%	67,8%	82,8%	88,3%	96,5%	95,8%	90,7%
Apurímac	87,0%	82,1%	83,1%	79,4%	94,1%	79,4%	101,3%	109,7%	80,4%
Arequipa	66,2%	64,1%	66,5%	67,0%	69,0%	72,8%	66,5%	82,4%	71,2%
Ayacucho	84,8%	81,8%	57,2%	91,6%	82,8%	87,0%	91,5%	102,3%	82,5%
Cajamarca	71,2%	79,3%	61,4%	70,8%	63,8%	68,2%	78,5%	77,9%	84,3%
Callao	76,7%	99,8%	80,2%	79,2%	80,6%	74,0%	67,8%	92,4%	84,8%
Cusco	66,7%	83,0%	93,0%	70,1%	92,0%	87,3%	87,7%	82,0%	91,1%
Huancavelica	43,0%	79,4%	73,4%	75,0%	86,2%	76,8%	85,3%	108,1%	81,3%
Huánuco	95,3%	86,5%	93,2%	89,3%	72,7%	75,7%	69,8%	101,6%	87,0%
Ica	71,2%	63,4%	74,3%	75,4%	73,3%	79,2%	79,8%	99,2%	74,0%
Junín	67,0%	64,6%	78,8%	68,8%	64,9%	77,6%	89,3%	75,4%	78,1%
La libertad	71,9%	89,2%	83,3%	82,5%	65,6%	79,9%	76,3%	90,6%	134,4%
Lambayeque	75,9%	78,9%	71,0%	67,0%	62,5%	78,0%	80,3%	92,6%	82,4%
Lima	80,9%	77,8%	83,3%	87,3%	84,7%	76,0%	80,9%	88,0%	86,0%
Loreto	100,6%	80,6%	93,6%	72,5%	93,8%	90,9%	117,8%	123,6%	95,4%
Madre de Dios	70,2%	78,5%	66,3%	76,6%	75,7%	70,5%	72,7%	94,9%	81,6%
Moquegua	39,9%	59,8%	61,6%	75,8%	71,9%	68,1%	68,8%	59,0%	56,5%
Pasco	72,9%	73,8%	71,6%	67,8%	76,4%	69,3%	76,0%	80,7%	95,0%
Piura	60,1%	62,3%	74,3%	74,5%	82,6%	64,7%	80,3%	80,6%	70,1%
Puno	56,9%	78,5%	70,2%	81,9%	83,8%	79,4%	83,3%	80,6%	74,9%
San Martín	58,1%	60,9%	69,7%	77,3%	82,7%	75,2%	79,4%	87,4%	69,8%
Tacna	73,2%	81,2%	71,7%	70,4%	77,7%	61,9%	64,1%	82,7%	73,2%
Tumbes	59,3%	49,6%	64,7%	72,1%	80,7%	83,7%	80,4%	88,5%	75,2%
Ucayali	82,2%	73,6%	89,4%	82,2%	72,4%	86,1%	72,4%	81,7%	84,8%

Source: Own elaboration based on harmonized household surveys for Peru by the IDB.
n.d. Not available. When the available data is not sufficient to calculate the percentage.
Only individuals with occupation, income, and frequency weightings were used.

In Graph 2, you can see the evolution of hourly earnings for women compared to men over the years analyzed. There is a clear earnings gap in all the years studied. The year 2013 stands out as the year with the most pronounced gap, as women earned on average 72% of what men earned per hour. In 2021, which is the last year considered in the study, women's average income represented 86% of men's income. Although there has been improvement over the years, the gender earnings gap in labor income remains significant.

Graph 2. Hourly earnings of women versus that of men



Source: Author's own elaboration based on Peru's household surveys harmonized by the IDB.

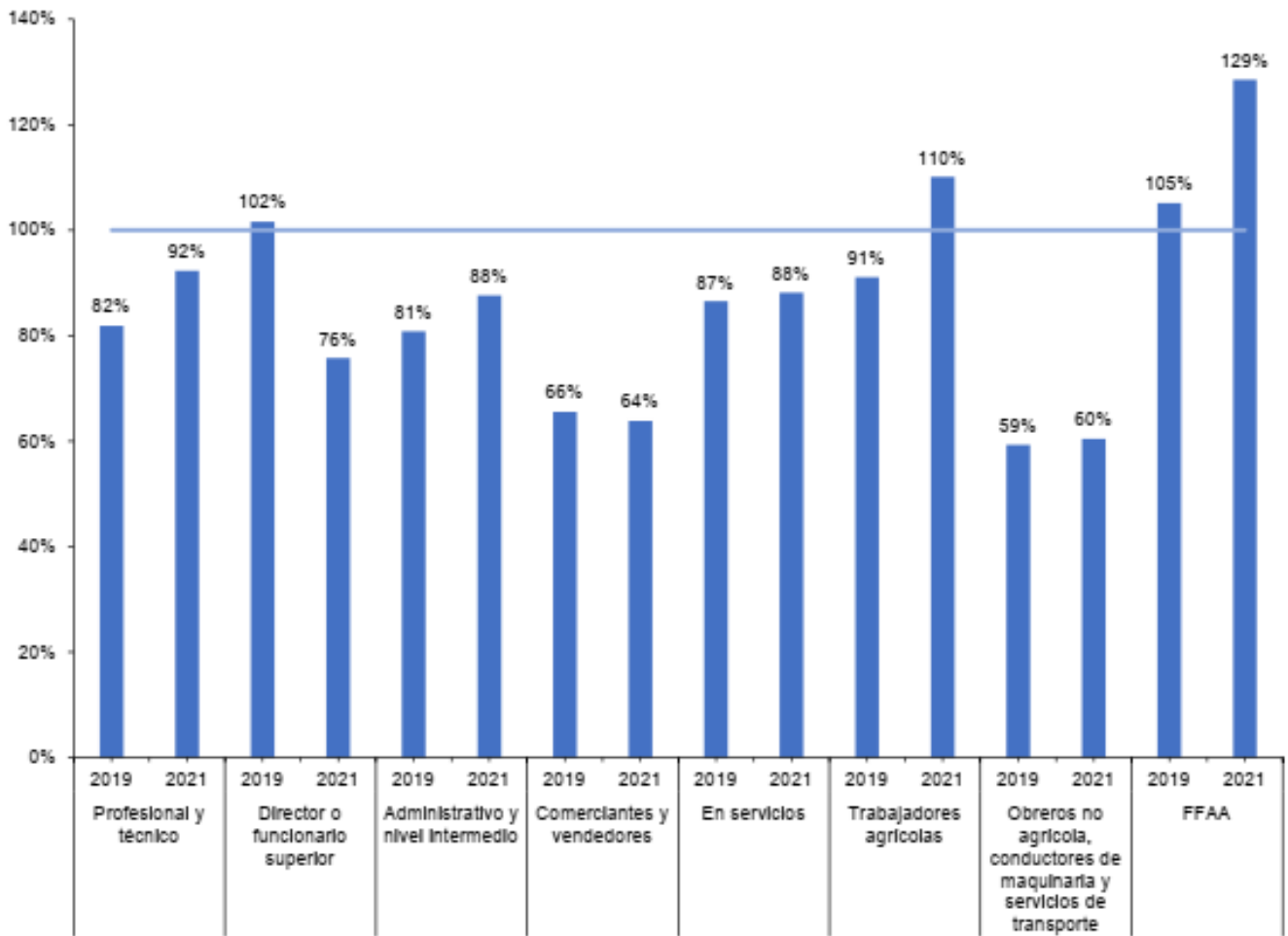
*Only individuals with occupation and income were considered.

In Graph 3, an analysis of the income gap by occupation before and after 2020 is presented, the year in which the Peruvian and global economy was affected by the outbreak of COVID-19. In 2019, it can be observed that there was a difference in favor of men in most occupations, with the exception of directors, senior officials, and the armed forces.

However, in 2021, this pattern remains, and only in the occupations of agricultural workers and the armed forces are there no pay disadvantages for women. It is important to note that the sample of women in the armed forces occupation is quite small, as in 2021, they represented only 11% of this occupation, as can be seen in Table A2. This

could introduce a selection bias, meaning that the few women working in these occupations may have exceptionally high job profiles and, therefore, higher salaries.

Graph 3. Hourly earnings of women versus men by occupation*



Source: Self-made using Peru's household surveys harmonized by the IDB.

*Only individuals with occupation and income were included.

3. Methodology

As previously mentioned, two methodologies will be used to address the gender income gap: the Blinder-Oaxaca decomposition and the Ñopo methodology.

Blinder-Oaxaca Decomposition

This first strategy for quantifying the evolution of the gender earnings gap allows us to decompose it into two parts. The first part is explained by the different control variables used to capture human capital, such as education, work experience, and occupation. The second part cannot be explained by these variables and could be associated with gender-differentiated regulations, prejudices, biases, or discrimination, as outlined by Becker (1957). This unexplained gap may originate from personal or statistical preferences, meaning that employers use group characteristics to evaluate individual characteristics. An example of this is the assumption that women of childbearing age are more likely to have children than older women, and therefore may interrupt their careers. Under this assumption, employers might pay lower wages to women of childbearing age to compensate for the higher probability of career interruptions, as explained by Hoyos, Ñopo, and Peña (2010).

The Blinder-Oaxaca method uses Mincer-type wage equations (Mincer, 1974), which, as described in Jann (2008), allow for the division of the difference in labor earnings into:

(i) a part explained by group differences and individual characteristics, such as education and work experience,

(ii) a second residual component that is unexplained.

Since there are two groups composed of men (H) and women (M), an explained variable (the logarithm of hourly labor earnings from the main activity), and a set of explanatory variables X, such as education and experience, among others, we seek to explain the average earnings difference between the two groups using the explanatory variables X.

$$EGap = E(Y_H) - E(Y_M) \quad (1)$$

Where $E(Y_g)$ denotes the expectation of the logarithm of earnings, which is the variable of interest, and g can be H if the equation is performed for men, or M if it is done for women. A Mincer-type equation is used to explain income in the form $Y_g = \alpha_g + \sum_{i=1}^k X_{ik} \beta_{gik} + \varepsilon_{gi}$. This expression can be substituted into equation [1]:

$$EGap = E \left(\alpha_H + \sum_{i=1}^k X_{ik} \beta_{Hik} + \varepsilon_{Hi} \right) - E \left(\alpha_M + \sum_{i=1}^k X_{ik} \beta_{Mik} + \varepsilon_{Mi} \right) \quad (2)$$

$$EGap = \widehat{\alpha}_H + \sum_{i=1}^k \overline{X_{ik}} \widehat{\beta}_{Hik} - \widehat{\alpha}_M - \sum_{i=1}^k \overline{X_{ik}} \widehat{\beta}_{Mik} \quad (3)$$

Reordering, it is possible to identify the contribution of the explanatory variables to the differences between the groups:

$$EGap = (\widehat{\alpha}_H - \widehat{\alpha}_M) + \sum_{i=1}^k \overline{X}_{ik} (\widehat{\beta}_{Hik} - \widehat{\beta}_{Mik}) + \sum_{i=1}^k (\overline{X}_{Hik} - \overline{X}_{Mik}) \widehat{\beta}_{Hik} \quad (4)$$

where the last component of this equation corresponds to the earnings gap accounted for by the explanatory variables, while the first two components correspond to unexplained differences.

The model was estimated using the following specification:

$$yhora_i = \beta_0 + \sum_{i=1}^3 \beta_i gaedu_i + \beta_4 exp_i + \beta_5 exp_i^2 + \sum_{i=6}^9 \beta_i gedad_i + \beta_{10} casado_i + \beta_{11} men6_i + \beta_{12} cnt_prop_i + \sum_{i=13}^{20} \beta_i rama_i + \sum_{i=21}^{28} \beta_i ocupa_i + \beta_{29} formal_i + \beta_{30} zona_i + \sum_{i=31}^n \beta_i region_i + \epsilon_i \quad (5)$$

Where:

- $yhora_i$ is the logarithm of nominal hourly earnings.
- $gaedu_i$ are dummy variables indicating the three highest levels of education attained as shown in table 2, relative to the base category, which is no educational level.
- exp_i are the estimated years of experience, which are calculated as age minus years of education.
- $gedad_i$ are four binary variables indicating age groups from table 2, using the 25-35 years segment as the base category.
- $casado_i$ is a binary variable that takes the value of 1 if the person is married.
- $men6_i$ is a binary variable that takes the value of 1 if there are children under six years of age living in the household.
- cnt_prop_i is a binary variable that takes the value of 1 if the person is self-employed or an independent worker.
- $rama_i$ are binary variables related to the different economic activities in which people are engaged, with agriculture, hunting, forestry, and fishing as the base category.
- $ocupa_i$ are six binary variables related to the different occupations of the surveyed individuals.
- $formal_i$ is a binary variable that takes the value of 1 if the person works in the formal sector.

- $zona_i$ is a binary variable that takes the value of 1 if the person works in the urban area.
- and $region_i$ are binary variables that refer to the different regions of the country.

This decomposition is performed separately for women and men. While this method is widely popularized in the literature, it has some limitations. On the one hand, it assumes a relationship between explanatory characteristics and earnings that may not be true. On the other hand, the model is only informative in the sense that it addresses how the gap is decomposed, which does not imply a causal relationship. Lastly, the method does not restrict its comparison to individuals with comparable characteristics. Ñopo's (2008) model was developed precisely when trying to address the first and last limitations mentioned.

Ñopo Decomposition

The method proposed by Ñopo (2008) is a non-parametric decomposition technique that, like the Blinder-Oaxaca model, aims to analyze income differences between men and women across the income distribution, not just the mean.

This Ñopo approach restricts the comparison solely to differences between men and women with comparable characteristics, known as the "common support." This allows for the generation of a synthetic counterfactual of individuals by matching men and women who have identical observable characteristics, without the need to assume any functional form in the relationship between explanatory variables and income. This is done through discrete characteristics, and thus, it does not require matching by propensity score or any other notion of distance between men's and women's characteristics (Ñopo 2008).

This procedure generates three groups:

- (i) Women and men matched in the "common support."
- (ii) Women with observable characteristics for which there are no comparable men, referred to as the "maid effect."
- (iii) Men for whom there are no comparable women, referred to as the "CEO effect."

The method allows men and women with identical characteristics to be part of a "common support," facilitating the breakdown of the income difference by observed and unobserved characteristics. On the other hand, the calculation of the maid and CEO effects is performed among those individuals who fall outside this "common support."

The "maid effect" refers to those women who, given their characteristics, do not have male counterparts with comparable characteristics. This is traditionally associated with women who have lower-ranking jobs that complement their household duties. On the other hand, the "CEO effect" refers to those men who, given their characteristics, hold top-level positions and do not have female counterparts with comparable characteristics.

In summary, this model decomposes the gender wage gap into four elements:

- The portion explained by observable characteristics.
- The portion explained by unobservable characteristics.
- The "maid effect," representing women with characteristics for which there are no comparable men.

- The "CEO effect," representing men with characteristics for which there are no comparable women.

$$\delta = \delta_X + \delta_F + \delta_M + \delta_0 \quad (6)$$

Where δ represents the total gender earnings difference; δ_X represents the earnings difference related to observable characteristics; δ_F is the measurement of the maid effect; δ_M is the measurement of the CEO effect; and δ_0 represents the unexplained earnings difference. As mentioned earlier, this last component could be related to issues of bias and discrimination. It is worth noting that the unexplained component of this model follows the same logic as the Blinder-Oaxaca model, allowing for a comparison between both estimates.

The Ñopo model is not without limitations. Like the Blinder-Oaxaca model, it is solely informative about how the gap is decomposed but does not imply a causal relationship. Additionally, because matching is constructed with discrete variables, the probability of finding a person with the same characteristics and endowments, both for men and women, decreases as the number of explanatory variables increases, i.e., it reduces the common support, as noted by Enamorado, Izaguirre, and Ñopo (2009). This problem is known as the "curse of dimensionality," and it's the reason why the Ñopo model should carefully consider the inclusion of new variables.

Another limitation shared by both methodologies is that they can only control for observable characteristics, and in the specific case of this study, only for the characteristics included in the harmonized household surveys by the IDB. In this sense, the gender earnings gap could also be affected by characteristics that are not observed in the survey, such as attitudinal factors, effort, and preferences for tasks in the labor market or at home, among others, which could be omitted in the analysis and thus introduce bias in the estimators due to the omission of relevant variables. Chioda (2011) provides a relevant example showing that preferences and attitudes between men and women towards work in the labor market may not be identical.

To achieve greater comparability and consistency, this study decided to perform both estimations. This approach will allow both to be compared with other studies using either of the two methodologies, as well as compared with each other since they share a common logic. Both models used hourly earnings as the dependent variable, allowing the calculation of the gender earnings gap. The explanatory variables used in the Ñopo model are:

$$gaedu_i, gedad_i, casado_i, men6_i, cnt_{prop}_i, rama_i, ocupa_i, formal_i, zona_i, region_i.$$

Note that here, the experience variables are not added to keep the common support high, i.e., to avoid falling into the "curse of dimensionality." This is considering that the experience variable is constructed with information related to age and education, which are already part of the explanatory variables in the regression.²⁰

In the case of Blinder-Oaxaca estimations, robust standard errors and probabilistic weights were used to be consistent with the survey structure, while in the Ñopo decomposition model, frequency weights were used, as this is what the methodology calls for.

²⁰ The calculations not included in the model showed that the aggregation of these variables significantly decreased the common support and increased the standard deviation of the variables but did not alter the overall results.

It is worth noting that by considering only the observed wages of employed individuals, both models may suffer from selection bias. Since labor force participation is higher among men, it can often be the case that women destined to receive lower wages do not enter the labor market, unlike men, for whom potential wages may have a smaller impact on labor force participation. If this is the case, the models presented in this study would underestimate the gap. However, the increase in female participation could be mitigating this bias, making it more challenging to compare over time.

Please note that this research uses similar control variables as those presented in past studies on the earnings gap in Latin America and the Caribbean, such as those by Hoyos and Ñopo (2010) and Ñopo (2012).

4. Results

The results presented in Table 3 are significant for understanding the evolution of the gender pay gap over the 25 years covered by the study. The reduction in the average hourly earnings gap between genders, with a clear pattern of decrease over time, is an important finding. It is also worth mentioning the variability in the pay gap over the years, ranging from 71% to 12%²¹, with a clear pattern of reduction over time, as seen in Figure 4.

The fact that the unexplained part (which could be due to biases, social norms, discrimination, and other unobserved factors) constitutes the largest portion of the total earnings gap is a common finding in gender earnings gap studies. This suggests that factors beyond differences in human capital, such as gender biases and prejudices, continue to be significant determinants of earnings inequality between men and women.

The analysis of decompositions by specific explanatory variables in Table 4 provides valuable information on which factors are contributing to the gender pay gap at different points in time. Changes in the earnings gap over time in relation to educational level and the composition of occupations in which women work are particularly interesting. The increase in women's years of education and their greater presence in specific occupations has contributed to narrowing the income gap. On the other hand, factors such as work experience, economic activities, and personal and family characteristics, while having a negative effect on the pay gap in some years, have become less important over time.

The negative effect of the residential area on the earnings gap is an interesting finding and highlights that female workers are more proportionately located in urban areas. This may be related to differences in employment and wage opportunities between urban and rural areas.

Taken together, these results suggest that while gender income inequalities persist, there have been significant improvements over time, possibly driven by factors such as increased female education and their presence in certain occupations. However, the unexplained part of the gap, which includes factors related to biases stemming from social norms, remains a relevant factor that needs to be addressed in policies aimed at reducing gender inequalities in the labor market.

²¹ Calculated as $diferencia/ghora_{mujer}$, the explained gap is calculated as $diferencia_{explicada}/ghora_{mujer}$, while the unexplained gap is calculated as $diferencia_{no\ explicada}/ghora_{mujer}$

Table 3. Blinder-Oaxaca Decomposition*

(Hourly Earnings)

	1997	1998	1999	2000	2001	2002	2003	2004
Differential								
Estimation for Men	3,188*** (0,100)	3,375*** (0,0973)	3,445*** (0,159)	2,687*** (0,156)	3,329*** (0,0975)	3,503*** (0,164)	3,584*** (0,139)	3,336*** (0,0882)
Estimation for Women	1,986*** (0,0758)	2,119*** (0,0740)	2,463*** (0,150)	1,638*** (0,0767)	2,232*** (0,0965)	2,311*** (0,108)	2,176*** (0,0968)	1,946*** (0,0466)
Difference	1,201*** (0,126)	1,256*** (0,122)	0,981*** (0,218)	1,049*** (0,174)	1,097*** (0,137)	1,192*** (0,196)	1,408*** (0,169)	1,391*** (0,0997)
Decomposition								
Explained	0,163 (0,0875)	0,225** (0,0861)	0,411** (0,136)	0,447*** (0,133)	0,179** (0,0666)	0,295* (0,119)	0,352** (0,108)	0,454*** (0,0701)
Unexplained	1,038*** (0,140)	1,031*** (0,135)	0,570** (0,200)	0,602*** (0,111)	0,918*** (0,147)	0,897*** (0,266)	1,056*** (0,197)	0,937*** (0,0880)
Decomposition (as a percentage of hourly earnings for women)								
Total	60%	59%	40%	64%	49%	52%	65%	71%
Explained	8%	11%	17%	27%	8%	13%	16%	23%
Unexplained	52%	49%	23%	37%	41%	39%	49%	48%
Observations	12.178	11.871	6.238	6.457	28.957	33.515	23.483	36.144
Differential								
Estimation for Men	3,248*** (0,116)	3,523*** (0,0830)	4,215*** (0,0970)	4,598*** (0,0871)	5,041*** (0,0981)	5,404*** (0,107)	5,797*** (0,125)	6,552*** (0,154)
Estimation for Women	2,088*** (0,0611)	2,150*** (0,0643)	2,917*** (0,114)	2,934*** (0,0833)	3,376*** (0,0979)	3,488*** (0,0885)	3,792*** (0,0795)	4,130*** (0,0951)
Difference	1,160*** (0,132)	1,372*** (0,105)	1,299*** (0,150)	1,664*** (0,121)	1,665*** (0,139)	1,916*** (0,139)	2,004*** (0,148)	2,422*** (0,181)
Decomposition								
Explained	0,313*** (0,0941)	0,539*** (0,0948)	0,399*** (0,0979)	0,305*** (0,0729)	0,456*** (0,0741)	0,514*** (0,0801)	0,239** (0,0784)	0,419*** (0,110)
Unexplained	0,847*** (0,188)	0,833*** (0,111)	0,899*** (0,195)	1,359*** (0,148)	1,209*** (0,152)	1,402*** (0,140)	1,765*** (0,176)	2,003*** (0,218)
Decomposition (as a percentage of hourly earnings for women)								
Total	56%	64%	45%	57%	49%	55%	53%	59%
Explained	15%	25%	14%	10%	14%	15%	6%	10%
Unexplained	41%	39%	31%	46%	36%	40%	47%	48%
Observations	35.386	38.100	41.321	40.412	41.288	40.684	46.181	45.865
Differential								
Estimation for Men	6,591*** (0,126)	6,861*** (0,136)	6,973*** (0,120)	7,375*** (0,107)	7,541*** (0,134)	7,773*** (0,142)	8,299*** (0,233)	7,431*** (0,173)
Estimation for Women	4,345*** (0,0869)	4,736*** (0,122)	4,841*** (0,107)	5,249*** (0,142)	5,357*** (0,0908)	5,364*** (0,0782)	6,751*** (0,118)	6,498*** (0,123)
Difference	2,246*** (0,153)	2,124*** (0,183)	2,132*** (0,161)	2,125*** (0,178)	2,184*** (0,162)	2,409*** (0,162)	1,548*** (0,262)	1,087*** (0,212)
Decomposition								
Explained	0,591*** (0,104)	0,512*** (0,0902)	0,475*** (0,0866)	0,530*** (0,126)	0,575*** (0,0859)	0,479*** (0,0811)	0,201 (0,180)	-0,353* (0,151)
Unexplained	1,656*** (0,152)	1,612*** (0,219)	1,656*** (0,182)	1,595*** (0,262)	1,609*** (0,175)	1,931*** (0,180)	1,347*** (0,180)	1,131*** (0,308)
Decomposition (as a percentage of hourly earnings for women)								
Total	52%	45%	44%	40%	41%	45%	23%	17%
Explained	14%	11%	10%	10%	11%	9%	3%	-5%
Unexplained	38%	34%	34%	30%	30%	36%	20%	15%
Observations	54.723	54.091	54.132	59.711	56.826	61.019	48.704	44.602

t-Statistic in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Own elaboration based on household surveys from Peru harmonized by the IDB. Only individuals with occupation and income, and probabilistic weighting were used.

Table 4, Components of the explained difference in Blinder-Oaxaca*

(Hourly earnings)

	1997	1998	1999	2000	2001	2002	2003	2004
Explained Difference	0,163	0,225**	0,411**	0,447***	0,179**	0,295*	0,352**	0,454***
Education	0,0562*	0,0497	0,0717	0,0573	0,0440	-0,0541	-0,00814	0,00809
Experience	0,0225	0,0361	0,0782*	0,0724	0,0359	0,128**	0,0714**	0,0800**
Personal and Family Characteristics	0,0388	0,0230	0,110*	0,0391	0,000723	0,0544	0,0613	0,0523**
Self-Employment	-0,00152	-0,00485	-0,00358	-0,0318	-0,00680	0,0111	0,0141	0,00768
Economic Activity	0,202	0,165	0,194	0,186*	0,174	0,668*	0,452***	0,410***
Occupation	-0,179	-0,0746	-0,00480	0,0385	-0,108	-0,484	-0,330**	-0,230**
Region	0,0144	-0,00688	-0,0222	0,0327	0,0318*	-0,00739	0,00487	0,0159
Formality	0,0132	0,0473**	0,0136	0,0543	0,00682	-0,0175	0,0871**	0,108***
Area	-0,00334	-0,0100	-0,0259	-0,00102	0,00130	-0,00331	-0,000476	0,00172
	2005	2006	2007	2008	2009	2010	2011	2012
Explained Difference	0,313***	0,539***	0,399***	0,305***	0,456***	0,514***	0,239**	0,419***
Education	0,0128	0,0326	0,0124	0,0199	-0,00905	0,0585*	0,0147	-0,0314
Experience	0,0457	0,0815**	0,101***	0,119***	0,138***	0,0901**	0,103***	0,131**
Personal and Family Characteristics	0,0480	0,0481*	0,0494*	0,00853	0,0236	0,0285	0,0234	0,00319
Self-Employment	0,00399	0,00727*	-0,0121*	-0,0193***	-0,0180**	-0,0190**	-0,0112*	-0,0241*
Economic Activity	0,175**	0,432***	0,619**	0,338***	0,457**	0,266***	0,283**	0,505**
Occupation	-0,116	-0,208*	-0,453*	-0,230**	-0,215	0,0159	-0,207*	-0,228
Region	0,0328	0,0243*	0,0105	0,0108	0,0155	0,0240*	0,0202	0,0255*
Formality	0,112***	0,123***	0,0736**	0,0598***	0,0645**	0,0520*	0,0158	0,0393
Area	-0,00161	-0,000671	-0,00164	-0,00168	0,000471	-0,00182	-0,00250	-0,00220

Table 4, Continuation

	2013	2014	2015	2016	2017	2018	2019	2020	2021
Explained Difference	0,591***	0,512***	0,475***	0,530***	0,575***	0,479***	0,201	-0,353*	0,140
Education	0,0661*	-0,0412	0,00722	-0,0164	0,0334	0,0172	-0,0984*	-0,0894*	-0,0450
Experience	0,104***	0,169***	0,105***	0,152***	0,113***	0,136***	0,135**	0,0565**	0,0349*
Personal and Family Characteristics	0,0350	-0,0111	0,0355	0,0495	-0,000603	0,0154	0,0162	0,120*	0,0294
Self-Employment	-0,0126	-0,0227***	-0,00465	-0,00683	-0,00745	-0,00888*	0,00557	0,0229	0,0444
Economic Activity	0,389***	0,531*	0,476***	0,586*	0,382***	0,212	0,605	0,266	-0,0308
Occupation	-0,0577	-0,227	-0,218	-0,349	-0,0164	0,00419	-0,421	-0,673*	0,129
Region	0,0254	0,0171	0,0221	0,0431**	0,0241	0,0432**	-0,0257	-0,0111	0,0109
Formality	0,0431*	0,0974***	0,0517**	0,0696*	0,0496**	0,0573*	0,0385*	0,00429	0,0103
Area	-0,00124	-0,000943	0,00100	0,00176	-0,00288	0,00184	-0,0541***	-0,0490***	-0,0429***

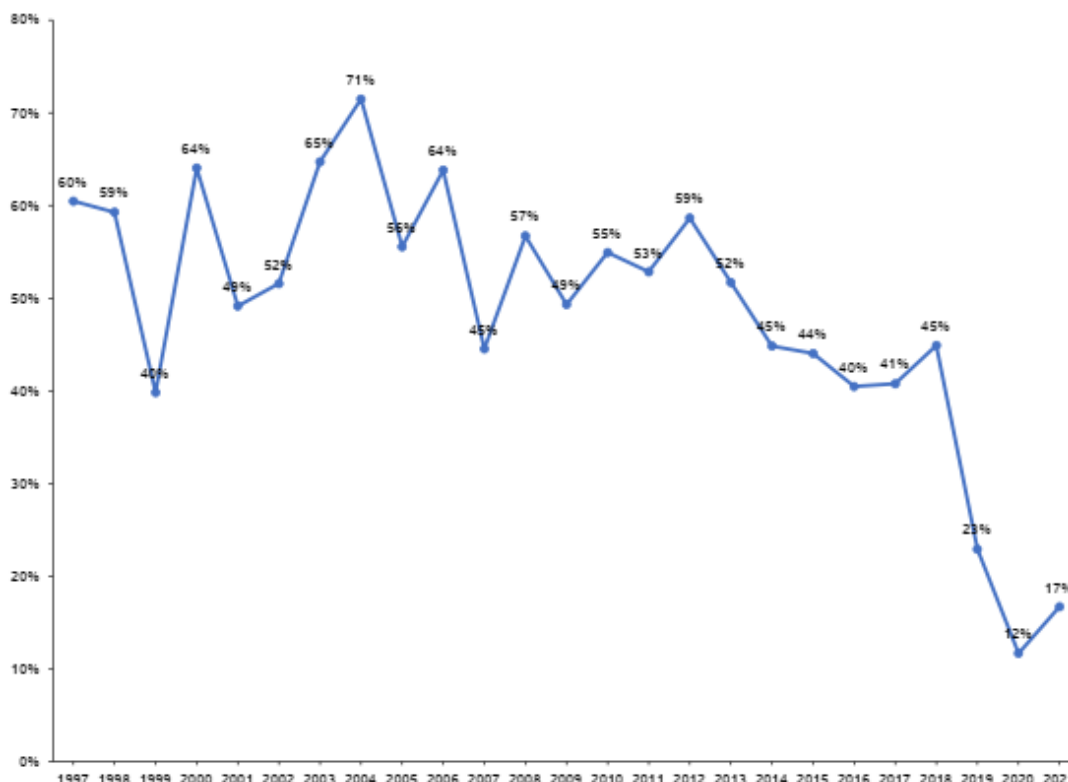
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Own elaboration based on household surveys from Peru harmonized by the IDB.

Only individuals with occupation and income, as well as probabilistic weightings, were used.

n.d. Not available. When the available data is insufficient to calculate the percentage.

"Graph 4. Total earnings gap estimated through Blinder-Oaxaca decomposition."



Source: Self-prepared based on household surveys from Peru harmonized by the IDB.

***Only individuals with occupation and income were included.**

The results presented in Table 5 are consistent with the trend observed in the results from Table 3, although the Ñopo decomposition methodology provides a slightly different approach. The persistence of a gender earnings gap in all the years analyzed highlights the need to address gender-based earnings inequalities. It is interesting to note that the reduction in the gender pay gap over the 25 years is primarily attributed to the explanatory variables included in the analysis. This indicates that changes in education, work experience, occupation, and other observable characteristics have positively influenced the reduction of the pay gap between men and women. This suggests that women have improved their human capital and are entering occupations and economic activities that were historically dominated by men. The unexplained part of the gap, which includes unobservable factors and the "domestic worker effect," remains an important determinant of the total earnings gap. The persistence of this unexplained part highlights the importance of addressing social norms and gender biases in the labor market.

The "CEO Effect," which historically increased the pay gap, shows a trend of helping to close the gap in 2021. This could be related to changes in labor dynamics and the composition of top management in companies. It is important to note that the Ñopo and Blinder-Oaxaca decomposition analyses, although providing slightly different results, are in line with common practices in international literature. Differences in the results may be due to the different methodologies and explanatory variables used in each approach. Overall, the results reinforce the idea that the gender earnings gap has decreased over time in Peru, but unexplained factors and gender biases still persist, requiring attention in public policies and the labor sphere.

Table 5. Ñopo Decomposition

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
(Total)	60%	61%	43%	68%	48%	52%	65%	71%	56%	64%	45%	57%	49%	54%	53%	59%	52%	45%	44%	40%	41%	45%	23%	12%	17%
(Unexplained)	49%	50%	15%	57%	54%	28%	64%	57%	42%	50%	38%	45%	43%	34%	42%	56%	39%	44%	47%	39%	33%	37%	19%	17%	20%
(CEO Effect)	11%	10%	32%	40%	11%	33%	9%	22%	28%	34%	14%	10%	11%	21%	10%	9%	11%	7%	7%	3%	4%	2%	1%	1%	-4%
(Maid Effect)	-10%	4%	10%	4%	-13%	-1%	-2%	-6%	-14%	-10%	-4%	2%	-1%	-2%	0%	-1%	3%	1%	3%	1%	6%	5%	14%	7%	9%
(Explained)	10%	-3%	-15%	-32%	-4%	-9%	-7%	-2%	-1%	-10%	-4%	0%	-4%	1%	2%	-6%	-1%	-7%	-13%	-3%	-3%	2%	-11%	-14%	-8%
% Men	30%	29%	23%	23%	41%	40%	36%	41%	40%	43%	42%	40%	42%	42%	41%	42%	44%	44%	44%	46%	45%	45%	41%	40%	39%
% Women	38%	39%	31%	33%	56%	57%	49%	56%	54%	57%	56%	54%	54%	54%	54%	55%	58%	57%	58%	59%	57%	57%	52%	51%	52%
Standard Error	6%	7%	10%	10%	4%	4%	7%	4%	3%	3%	4%	4%	3%	3%	3%	4%	3%	3%	3%	2%	2%	2%	2%	3%	2%

Source: Own elaboration based on the household surveys in Peru harmonized by the Inter-American Development Bank (IDB).

Only individuals with occupation, income, and frequency weightings were used.

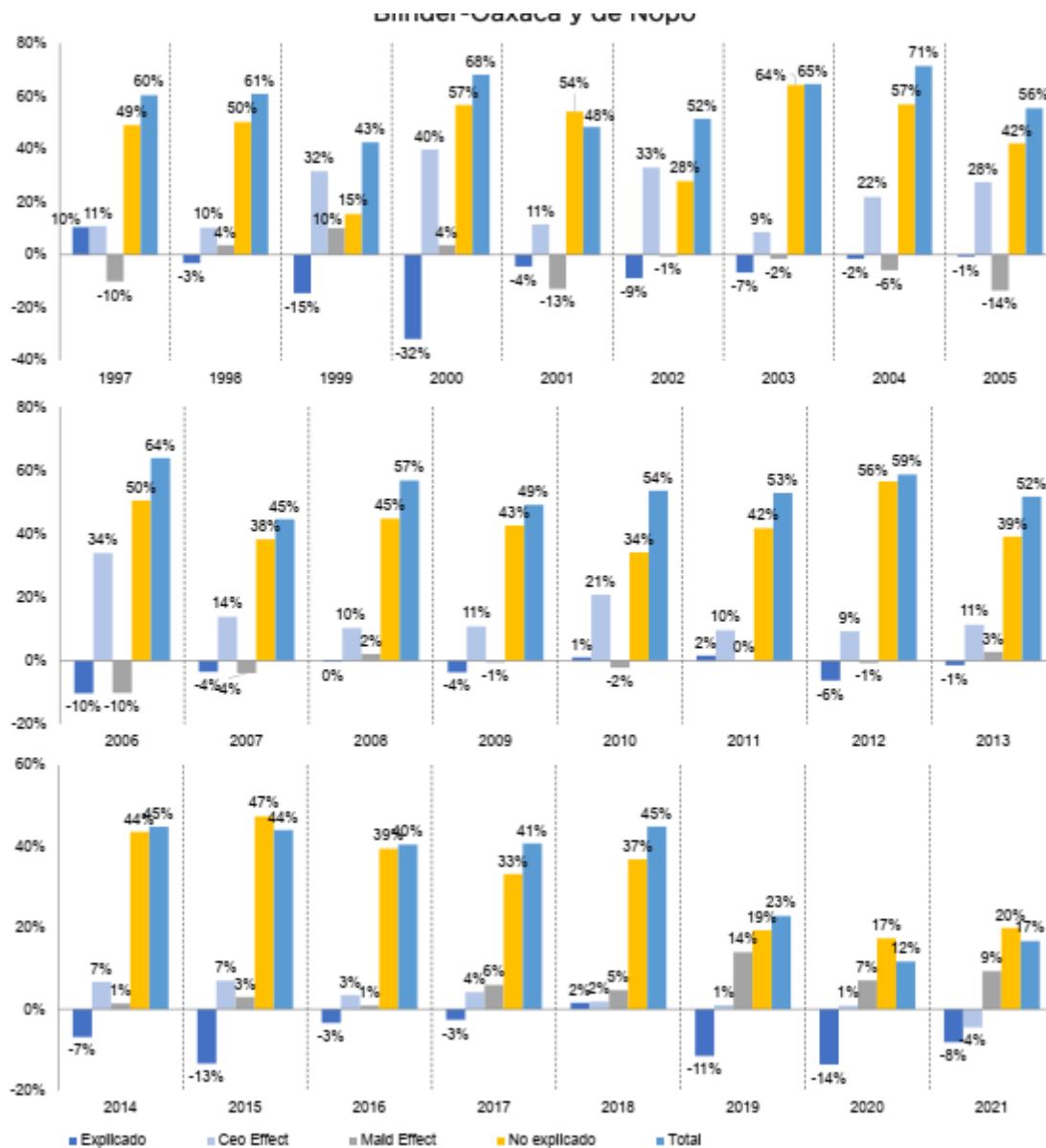
Graph 5 provides a useful visual representation of the evolution of the gender earnings gap and how it decomposes into explained and unexplained components over the study period. The findings are consistent with the idea that while there has been a reduction in the gap over time, a significant portion of it still cannot be explained by the observable variables included in the analysis.

In 2021, the component explained by the variables used in the model would be helping to reduce the gap by 8%. This suggests that factors such as higher levels of education and a good labor profile have contributed significantly to the reduction of the gender earnings gap. However, there is still a 20% gap that cannot be explained by these variables and is attributed to unobservable factors such as gender biases and discrimination. This highlights the persistence of challenges in the labor market that go beyond observable characteristics and underscores the importance of addressing these issues to achieve greater gender equality in income.

The conclusion that the gap would be 12% higher in 2021²² without higher levels of education, a good labor profile, and the CEO effect is significant. It underscores how advancements in education and the inclusion of women in occupations and labor activities historically dominated by men have been key factors in reducing the gender earnings gap in Peru. However, despite these advancements, there is still work to be done to address the unobservable factors that continue to contribute to the gap. These factors may include biases, discrimination, and labor practices that negatively impact women in the labor market.

²² The 12% corresponds to the sum of the explained gap (8%) and the CEO effect (4%).

Graph 5. Total earnings gap estimated through Blinder-Oaxaca and Ñopo decompositions

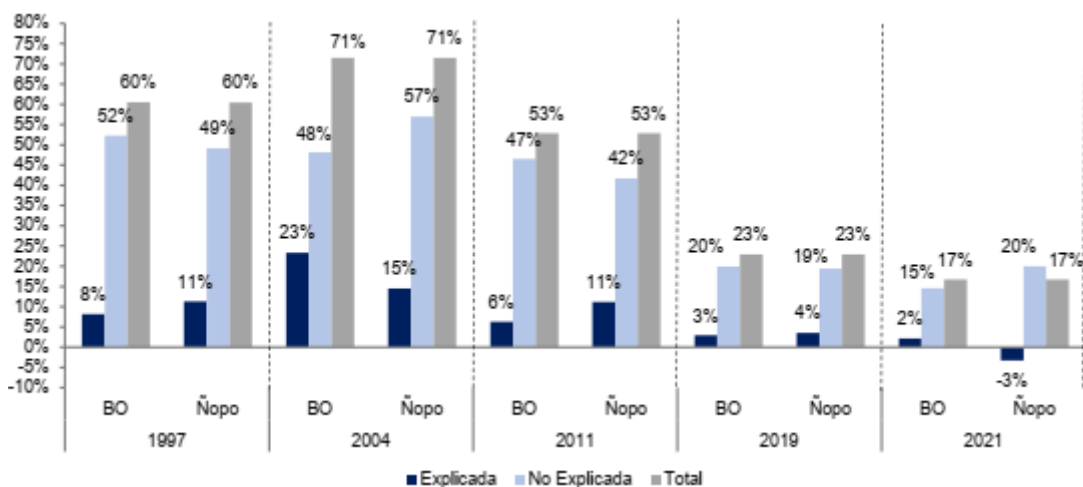


Source: Own elaboration based on harmonized household surveys in Peru by the IDB.

*Only individuals with occupation and income were used.

In graph 6, gender earnings gaps calculated using both methodologies for the years 1997, 2004, 2011, 2019, and 2021 are compared. These years were chosen to maintain intervals of time as constant as possible and to try to obtain a pre and post-2020 picture, the year when the COVID-19 crisis erupted. Both methodologies consistently show that for all years, there is an explained earnings gap and an unexplained one, with the latter being larger. The only exception is in Ñopo's model in 2021, which shows that the explained variables are already helping to close the gender gap, which is related to improvements in the labor profile of women in Peru.

Graph 6. Total earnings gap estimated through the Blinder-Oaxaca (BO) and Ñopo decompositions*



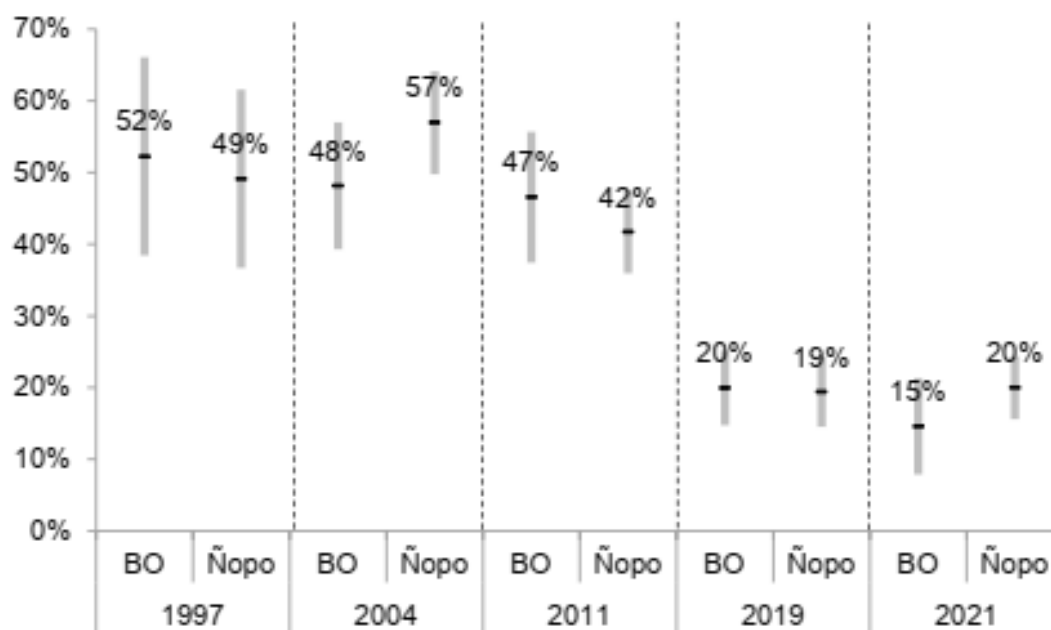
Source: Own elaboration based on household surveys harmonized by the BID.

*Only individuals with occupation and income were used.

Note: For the Ñopo methodology, the data for the explained component is calculated as the sum of the explained component, the CEO effect, and the domestic worker effect.

On the other hand, Graph 7 presents the evolution of the unexplained gap for the same periods used in Graph 6. Confidence intervals for 1.96 standard deviations above and below the estimator are included, allowing us to appreciate that both methodologies show a statistically significant unexplained earnings gap for the different years analyzed, being statistically equal for both methodologies at the 95% level of statistical significance.

Graph 7. Unexplained earnings gap estimated through Blinder-Oaxaca and Ñopo decompositions



Source: Own elaboration based on household surveys from Peru harmonized by the IDB.

Note: The bars represent the unexplained component at the 95% confidence level.

Furthermore, the Ñopo decomposition allows for disaggregating the earnings gap for the categories of different explanatory variables. In Graph 8, the earnings gap, both total and unexplained, is presented according to the level of education attained. In this graph, it can be observed that historically, the total earnings gap has been more pronounced among individuals with no education or only completed primary education. However, it is noticeable that in recent years, this pattern has been changing, and the gap between these groups is no longer as significant.

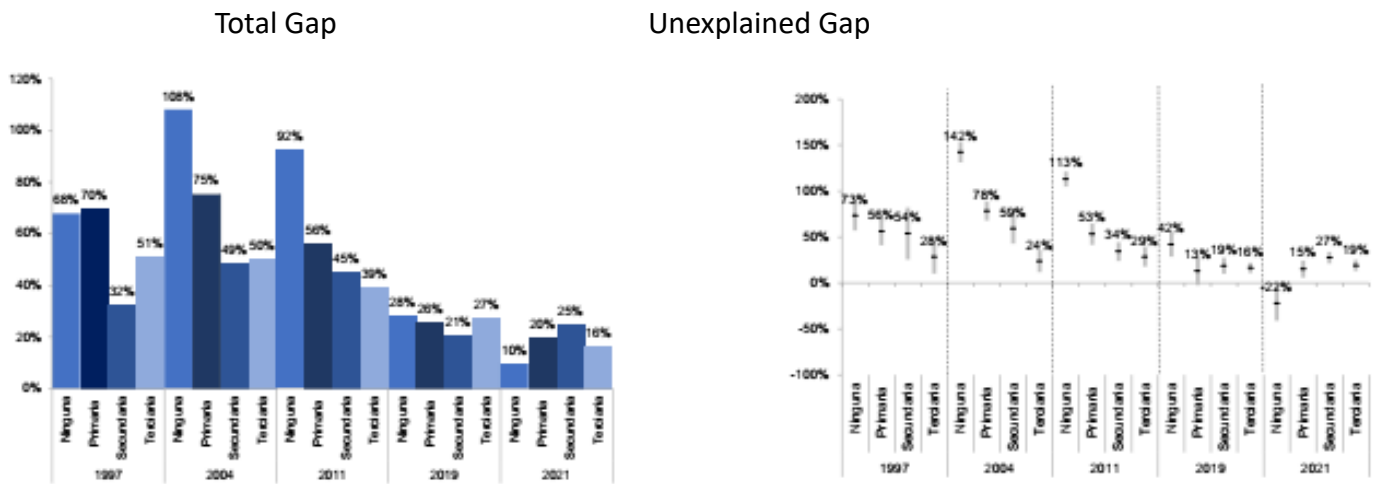
On the other hand, Graph 8 also shows the unexplained gap, with confidence intervals aggregated using 1.96 standard deviations above and below the estimator, i.e., at the 95% confidence level. It can be noted that the unexplained gap is statistically significant in all years for all levels of education. The only exception is among individuals with no education in the year 2021.

Graph 9 presents the gap disaggregated by formality. In this graph, a clear distinction in the total gap can be seen between individuals working in the formal sector and those in the informal sector. A higher earnings gap by gender is recorded among individuals linked to the informal sector in all the periods analyzed.

Lastly, in Graph 9, confidence intervals at the 95% confidence level are also added for the unexplained gap by formality level. It is found that there is a statistically significant unexplained gap both in the formal and informal sectors in all the years analyzed. It can be seen that historically, this gap was higher in the informal sector but has been decreasing over time to reach a similar level as the unexplained gap in the formal sector.

The situation of the gap in the informal sector may be due to the lack of labor legislation regulating employment relationships and prevailing business practices there. This is relevant since in Peru, labor informality approaches 86% overall (see Table A1), reaching 90% for women and 84% for men in 2021.

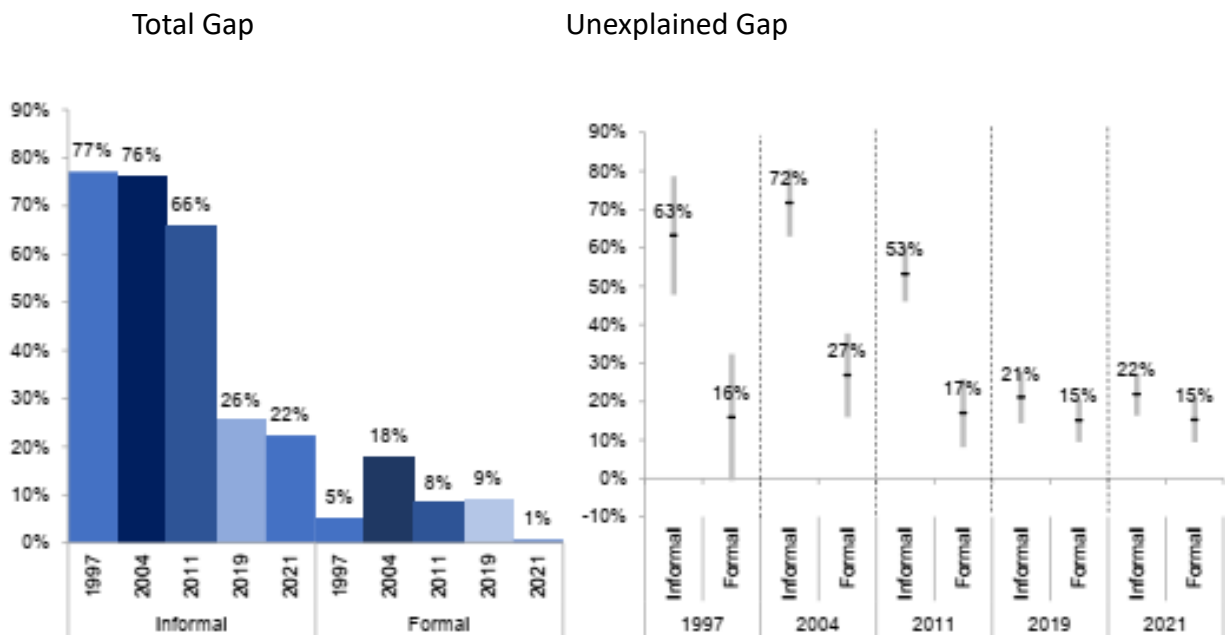
Graph 8. Earnings Gap Estimated by Ñopo Decomposition by Education Level



Source: Own elaboration based on household surveys harmonized by the IDB.

Note: The bars present the unexplained component at a 95% confidence level.

Graph 9. Earnings Gap Estimated Through the Ñopo Decomposition by Formality



Source: Own elaboration based on harmonized household surveys in Peru by the IDB.

Note: The bars represent the unexplained component at a 95% confidence level.

5. Conclusions

According to this study's findings, a significant gender earnings gap can be observed, which, however, seems to decrease over time. This gap is mainly explained by unobservable factors in the permanent household surveys. This implies that variables such as experience, personal and family characteristics, sector and economic activity, and region of the country are not factors that explain the gap. It can be concluded that this could be more related to issues of regulations, biases, or discrimination than with individual characteristics or preferences.

This gap is deeper among people working in the informal sector. Likewise, it is heterogeneous among occupations but statistically significant in most of them. The results show that an unjustifiable earnings gap between men and women persists, limiting income opportunities for women.

The main variables that would be contributing to closing the gender pay gap in Peru are the increase in the average years of education for women, as well as the occupations where women are currently more active. On the other hand, experience, economic activities, and personal and family characteristics, such as age, marital status, and the presence of minors in the household, would represent factors generating a gender pay gap in favor of men. In addition, it was found that the geographical area would be contributing to reducing the pay gap due to the high proportion of women working in economically dynamic areas of the country.

These conclusions mostly coincide with the literature on gender income gaps in Peru. Like Amaya and Mougnot (2019), it was determined that the unexplained gap remains very significant in the country; however, the inclusion of different characteristics and social variables, as shown by Saco et al. (2022), helps reduce the percentage of the gap attributed to the unobservable factor (known as discrimination).

In line with Ñopo (2009) and Montes (2007), it is found that the level of education that women have achieved, i.e., the increase in human capital endowments, is one of the characteristics that most helps to close the existing gap. However, as shown in the work of Vaccaro et al. (2022), this paper finds that the unobservable factor persists as one of the largest contributors to the income gap unfavorable to women. On the other hand, as in the study by Quispe (2020), it is evident that the gap is more pronounced in the informal sector.

This document contributes to diagnosing the evolution of the situation of the gender earnings gap year after year in Peru between 1997 and 2021. The conclusions offered here are relevant since for public policies to be evidence-based, it is essential to have reliable data and estimates that can serve as input for decision-makers responsible for policy formulation.

The conclusions previously presented are open to the possibility of being complemented by future analyses through greater disaggregation and deepening of the earnings gap for groups of people with different specific characteristics. The same applies to the use of new resources that allow for a better quantification of the earnings gap and its determinants. Finally, there is a need to conduct a specific study on the consequences that the pandemic has had and continues to have on the earnings gap in Peru.

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Table A1 (Continued)

	2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		2020		2021	
	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M
Years of Education	10.3	9.7	10.3	9.8	10.4	9.9	10.4	9.9	10.4	9.9	10.4	10.0	10.5	10.0	10.5	10.1	10.6	10.1	10.6	9.8	10.5	9.8	10.5	9.8
None	10%	16%	10%	16%	10%	15%	10%	15%	9%	15%	9%	14%	9%	15%	9%	14%	8%	14%	8%	16%	8%	16%	9%	16%
Primary	29%	27%	28%	27%	28%	25%	27%	26%	27%	26%	27%	26%	27%	25%	27%	25%	26%	25%	26%	26%	26%	26%	26%	26%
Secondary	43%	37%	44%	38%	44%	39%	45%	38%	46%	39%	46%	40%	46%	39%	46%	41%	47%	41%	47%	39%	48%	40%	48%	40%
Tertiary	18%	19%	18%	20%	19%	20%	19%	20%	18%	20%	18%	20%	18%	20%	18%	20%	19%	20%	19%	20%	18%	18%	17%	18%
Years of Experience	19.5	20.3	19.9	20.5	20.1	20.7	20.2	21.0	20.4	21.3	20.4	21.0	20.5	21.2	20.7	21.4	21.0	21.7	20.7	22.2	20.4	22.1	20.5	22.3
15-25	31%	30%	31%	30%	31%	30%	30%	29%	30%	28%	29%	28%	29%	28%	28%	27%	27%	27%	29%	30%	26%	29%	26%	26%
26-35	22%	22%	21%	21%	19%	20%	20%	20%	19%	20%	20%	21%	20%	20%	20%	20%	20%	20%	20%	19%	20%	20%	20%	20%
36-45	19%	20%	19%	20%	20%	20%	20%	21%	20%	20%	20%	20%	21%	20%	20%	20%	20%	20%	21%	19%	21%	19%	21%	21%
46-55	17%	17%	17%	17%	17%	18%	17%	18%	18%	18%	18%	17%	18%	17%	18%	18%	18%	19%	18%	19%	18%	19%	18%	19%
56-65	11%	11%	12%	12%	13%	12%	13%	13%	13%	13%	13%	13%	14%	13%	14%	14%	15%	14%	14%	15%	14%	14%	14%	15%
Married	54%	51%	54%	51%	53%	50%	53%	50%	53%	50%	54%	51%	55%	51%	54%	51%	54%	50%	52%	52%	51%	51%	52%	50%
Children under 6 years old in the household	36%	39%	35%	38%	34%	36%	32%	36%	32%	34%	33%	36%	33%	36%	32%	35%	32%	35%	31%	34%	28%	31%	27%	30%
Agriculture, hunting, forestry, and fishing	23%	11%	24%	10%	23%	10%	23%	10%	24%	11%	24%	11%	24%	12%	25%	11%	25%	12%	25%	21%	33%	29%	29%	26%
Mining and quarrying	2%	0%	2%	0%	2%	0%	2%	0%	2%	0%	2%	0%	2%	0%	2%	0%	2%	0%	2%	0%	2%	0%	2%	0%
Manufacturing industry	12%	11%	11%	11%	12%	11%	12%	11%	11%	10%	11%	10%	11%	10%	11%	10%	10%	9%	10%	8%	9%	8%	10%	8%
Electricity, gas, and water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Construction	11%	1%	11%	1%	11%	1%	12%	1%	12%	1%	12%	1%	11%	1%	11%	1%	11%	1%	11%	1%	11%	0%	13%	1%
Trade, restaurants, and hotels	16%	39%	16%	40%	16%	41%	17%	41%	16%	41%	15%	41%	15%	40%	16%	42%	16%	42%	17%	39%	15%	34%	17%	38%
Transport and storage	13%	2%	13%	2%	13%	2%	13%	2%	13%	2%	14%	2%	14%	2%	14%	2%	14%	2%	13%	2%	12%	1%	13%	2%
Financial establishments, insurance, and real estate	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Social and community services	21%	34%	21%	35%	21%	34%	21%	34%	20%	33%	20%	34%	20%	33%	21%	33%	20%	32%	20%	29%	17%	25%	16%	25%
Amazonas	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Ancash	4%	3%	4%	3%	4%	4%	3%	4%	3%	4%	3%	4%	3%	4%	3%	4%	3%	4%	3%	4%	3%	4%	3%	3%
Apurímac	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	2%	1%	1%	1%
Arequipa	4%	5%	4%	4%	4%	5%	4%	5%	4%	5%	4%	5%	4%	5%	4%	5%	4%	5%	4%	4%	4%	4%	4%	4%
Ayacucho	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Cajamarca	4%	4%	4%	4%	4%	4%	4%	4%	4%	5%	4%	4%	4%	4%	4%	4%	4%	4%	5%	5%	5%	5%	4%	5%
Callao	3%	4%	3%	4%	3%	4%	4%	4%	3%	4%	3%	4%	3%	4%	3%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Cusco	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Huancavelica	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Huanuco	3%	2%	3%	2%	3%	2%	3%	2%	3%	2%	3%	2%	3%	2%	3%	2%	3%	2%	3%	3%	3%	3%	3%	3%
Ica	3%	2%	3%	3%	2%	3%	3%	2%	3%	3%	2%	3%	3%	2%	3%	3%	2%	3%	2%	3%	2%	2%	2%	2%
Junin	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
La libertad	5%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Lambayeque	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Lima	33%	36%	33%	36%	33%	35%	33%	35%	33%	36%	33%	36%	34%	36%	33%	36%	34%	36%	34%	33%	33%	33%	34%	34%
Loreto	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Madre de Dios	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moquegua	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Pasco	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Piura	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Puno	4%	4%	4%	4%	5%	4%	4%	4%	4%	4%	4%	5%	4%	4%	4%	4%	4%	5%	5%	4%	5%	4%	5%	5%
San Martín	3%	2%	3%	2%	3%	3%	3%	2%	3%	2%	3%	2%	3%	2%	3%	2%	3%	2%	3%	3%	3%	3%	3%	3%
Tacna	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Tumbes	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Ucayali	2%	1%	2%	2%	2%	1%	2%	2%	2%	1%	2%	1%	2%	1%	2%	2%	1%	2%	1%	2%	1%	1%	1%	1%
Urban	77%	84%	78%	84%	78%	83%	79%	84%	79%	84%	79%	85%	80%	85%	80%	85%	81%	85%	80%	81%	80%	81%	81%	82%
Formal	17%	10%	18%	11%	20%	12%	20%	12%	20%	13%	20%	13%	20%	13%	20%	13%	20%	13%	20%	12%	15%	9%	16%	10%
Self-employed	28%	27%	29%	26%	28%	25%	28%	26%	28%	25%	29%	25%	29%	25%	30%	26%	30%	27%	29%	24%	27%	20%	28%	25%

Source: Self-made based on household surveys in Peru harmonized by the IDB.

n.d. Not available. When the data is not sufficient to calculate the percentage.

Probabilistic weightings are used.

Table A2. Women's Participation by Occupation (%) and Average Hourly Earnings (ARS)

	1997		1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009	
	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL
Professional and Technician	44%	5.0	41%	5.7	42%	6.6	43%	5.1	43%	6.2	44%	7.7	45%	6.8	43%	6.2	45%	6.5	42%	6.9	46%	8.7	46%	7.7	46%	8.9
Director or Senior Official	29%	10.8	23%	5.3	27%	7.0	25%	7.8	27%	13.2	23%	10.7	30%	9.6	26%	7.5	27%	14.2	30%	9.7	29%	10.0	21%	8.3	37%	21.5
Administrative and Intermediate Level	55%	3.2	55%	4.4	59%	5.3	58%	4.0	57%	4.6	56%	4.6	54%	5.3	52%	5.0	52%	4.4	53%	6.4	53%	6.5	52%	5.6	53%	6.5
Merchants and Salespersons	67%	1.9	67%	1.5	67%	2.1	68%	1.8	66%	2.1	66%	2.0	66%	1.8	67%	1.7	66%	1.9	68%	1.8	69%	2.3	71%	2.6	69%	2.7
In Services	66%	1.8	66%	1.7	68%	1.9	63%	1.6	62%	2.4	64%	1.8	67%	1.8	62%	1.6	62%	1.8	64%	1.9	63%	2.2	64%	2.4	65%	2.5
Agricultural Workers	36%	0.4	36%	0.4	38%	0.4	39%	0.3	38%	0.4	39%	0.3	40%	0.3	40%	0.4	40%	0.4	40%	0.4	40%	0.5	40%	0.5	42%	0.8
Non-Agricultural Laborers, Machinery Operators, and Transport Services	19%	1.4	20%	1.6	18%	1.5	18%	1.6	18%	1.7	19%	1.6	15%	1.9	17%	1.7	18%	1.8	19%	1.8	19%	1.8	19%	2.3	19%	2.6
Others	4%	3.0	4%	1.0	1%	5.8	8%	4.0	5%	3.6	15%	3.6	6%	5.5	8%	3.9	6%	5.8	7%	4.9	3%	4.4	8%	6.1	7%	4.3
Total	52%	2.0	52%	2.0	52%	2.3	52%	1.9	51%	2.2	51%	2.3	51%	2.2	51%	1.9	51%	2.1	51%	2.2	51%	2.9	52%	2.9	51%	3.4

	2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		2020		2021	
	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL	(%)	SOL
Professional and Technician	44%	8.7	46%	8.9	45%	9.8	45%	10.5	47%	11.8	47%	12.1	47%	11.3	45%	13.1	45%	12.5	47%	13.4	47%	14.1	47%	13.9
Director or Senior Official	28%	13.6	39%	13.7	30%	14.0	31%	18.9	26%	17.6	34%	19.2	36%	22.6	38%	20.4	29%	20.7	32%	28.0	38%	27.0	33%	21.5
Administrative and Intermediate Level	54%	6.6	55%	6.8	54%	7.0	53%	8.1	54%	8.3	55%	8.2	53%	9.3	53%	8.7	56%	8.6	53%	9.2	52%	9.5	56%	9.1
Merchants and Salespersons	70%	3.2	71%	3.4	72%	3.3	70%	3.4	71%	3.6	73%	3.8	72%	4.1	73%	4.0	72%	4.2	72%	4.7	71%	4.7	73%	4.4
In Services	65%	2.8	66%	3.1	65%	3.3	64%	3.8	65%	4.0	64%	4.2	65%	5.3	67%	5.2	68%	4.8	67%	5.6	64%	5.8	66%	5.6
Agricultural Workers	42%	0.8	41%	0.9	40%	1.3	42%	1.0	41%	1.0	42%	1.0	42%	1.2	41%	1.2	41%	1.6	43%	3.8	42%	3.3	45%	4.8
Non-Agricultural Laborers, Machinery Operators, and Transport Services	20%	2.7	18%	2.8	18%	3.2	18%	3.0	17%	3.4	16%	3.8	17%	3.8	17%	4.0	17%	3.8	16%	4.3	17%	4.5	16%	4.3
Others	9%	5.4	11%	4.9	7%	6.9	10%	7.5	12%	9.2	12%	9.5	14%	10.3	14%	10.3	15%	10.4	12%	11.2	11%	12.7	11%	13.7
Total	51%	3.5	51%	3.8	51%	4.1	51%	4.3	52%	4.7	52%	4.8	52%	5.3	52%	5.4	52%	5.4	52%	6.8	52%	6.7	52%	6.5

Source: Own elaboration based on household surveys in Peru harmonized by the IDB.

Probabilistic weighting is used.